Enterasys Matrix™

DFE-Diamond Series

Hardware Installation Guide

Module 7GR4270-12
Module 7GR4202-30
Module 7GR4280-19
Module 7KR4290-02

en*terasys*®

Electrical Hazard: Only qualified personnel should perform installation procedures.

Riesgo Electrico: Solamente personal calificado debe realizar procedimientos de instalacion.

Elektrischer Gefahrenhinweis: Installationen sollten nur durch ausgebildetes und qualifiziertes Personal vorgenommen werden.

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This product complies with the following: 47 CFR Parts 2 and 15, CSA C108.8, 89/336/EEC, EN 55022, EN 61000-3-2, EN 61000-3-3, EN 55024, AS/NZS CISPR 22, VCCI V-3.

Compatibilidad Electromágnetica (EMC)

Este producto de Enterasys cumple con lo siguiente: 47 CFR Partes 2 y 15, CSA C108.8, 89/336/EEC, EN 55022, EN 55024, EN 61000-3-2, EN 61000-3-3, AS/NZS CISPR 22, VCCI V-3.

Elektro- magnetische Kompatibilität (EMC)

Dieses Produkt entspricht den folgenden Richtlinien: 47 CFR Parts 2 and 15, CSA C108.8, 89/336/EEC, EN 55022, EN 61000-3-2, EN 61000-3-3, EN 55024, AS/NZS CISPR 22, VCCI V-3.

Hazardous Substances

This product complies with the requirements of European Directive, 2002/95/EC, Restriction of Hazardous Substances (RoHS) in Electrical and Electronic Equipment.

European Waste Electrical and Electronic Equipment (WEEE) Notice

In accordance with Directive 2002/96/EC of the European Parliament on waste electrical and electronic equipment (WEEE):

1. The symbol above indicates that separate collection of electrical and electronic equipment is required and that this product was placed on the European market after August 13, 2005, the date of enforcement for Directive 2002/96/EC.

2. When this product has reached the end of its serviceable life, it cannot be disposed of as unsorted municipal waste. It must be collected and treated separately.

3. It has been determined by the European Parliament that there are potential negative effects on the environment and human health as a result of the presence of hazardous substances in electrical and electronic equipment.

4. It is the users' responsibility to utilize the available collection system to ensure WEEE is properly treated.

    For information about the available collection system, please go to http://www.enterasys.com/services/support/ or contact Enterasys Customer Support at 353 61 705586 (Ireland).

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Safety Information
Class 1 Laser Transceivers

The single mode network expansion modules use Class 1 laser transceivers.
Read the following safety information before installing or operating these modules.

The Class 1 laser transceivers use an optical feedback loop to maintain Class 1 operation limits. This control loop eliminates the need for maintenance checks or adjustments. The output is factory set, and does not allow any user adjustment. Class 1 Laser transceivers comply with the following safety standards:

- 21 CFR 1040.10 and 1040.11 U.S. Department of Health and Human Services (FDA).

- IEC Publication 825 (International Electrotechnical Commission).

- CENELEC EN 60825 (European Committee for Electrotechnical Standardization).

When operating within their performance limitations, laser transceiver output meets the Class 1 accessible emission limit of all three standards. Class 1 levels of laser radiation are not considered hazardous.

When the connector is in place, all laser radiation remains within the fiber. The maximum amount of radiant power exiting the fiber (under normal conditions) is -12.6 dBm or 55×10^{-6} watts.

Removing the optical connector from the transceiver allows laser radiation to emit directly from the optical port. The maximum radiance from the optical port (under worst case conditions) is 0.8 W cm^{-2} or 8×10^3 W m^2 sr-1.

Do not use optical instruments to view the laser output. The use of optical instruments to view laser output increases eye hazard. When viewing the output optical port, power must be removed from the network adapter.

Declaration of Conformity

Application of Council Directive(s):	**89/336/EEC** **73/23/EEC**
Manufacturer's Name:	**Enterasys Networks, Inc.**
Manufacturer's Address:	**50 Minuteman Road** **Andover, MA 01810** **USA**
European Representative Address:	**Enterasys Networks, Ltd.** **Nexus House, Newbury Business Park** **London Road, Newbury** **Berkshire RG14 2PZ, England**
Conformance to Directive(s)/Product Standards:	**EC Directive 89/336/EEC** **EN 55022** **EN 61000-3-2** **EN 61000-3-3** **EN 55024** **EC Directive 73/23/EEC** **EN 60950** **EN 60825**
Equipment Type/Environment:	**Networking Equipment, for use in a Commercial or Light Industrial Environment.**

Enterasys Networks, Inc. declares that the equipment packaged with this notice conforms to the above directives.

Enterasys Networks, Inc.
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About This Guide

This guide provides an overview, installation and troubleshooting instructions, and specifications for the Enterasys Matrix™ DFE-Diamond 7GR4270-12, 7GR4202-30, 7GR4280-19, and 7KR4290-02 modules, Mini-GBIC interface cards, and XENPAK interface modules.

For information about the CLI (Command Line Interface) set of commands used to configure and manage the DFE modules, refer to the *Enterasys Matrix DFE-Diamond/Platinum Series Configuration Guide*.

> **Note:** In this guide, the following terms are used:
> - *DFE* refers to Distributed Forwarding Engine series of modules.
> - *DFE module* or *module* refers to the 7GR4270-12, 7GR4202-30, 7GR4280-19, or 7KR4290-02. If the information applies only to one of the modules, the module is referred to by its model number (such as 7GR4270-12).
> - Network expansion module or NEM refers to an optional uplink card installed on the main logic board and accessible through the option slot of the 7GR4280-19.
> - *Mini-GBIC* (Mini-Gigabit Interface Card) refers to a smaller optional interface card that plugs into a NEM or the 7GR4270-12 or 7GR4280-19 port slots.
> - *XENPAK PHY* refers to a type of physical interface module that plugs into the 7KR4290-02.

Who Should Use This Guide

> **Electrical Hazard:** Only qualified personnel should perform installation procedures.
>
> **Riesgo Electrico:** Solamente personal calificado debe realizar procedimientos de instalacion.
>
> **Elektrischer Gefahrenhinweis:** Installationen sollten nur durch ausgebildetes und qualifiziertes Personal vorgenommen werden.

This guide is intended for a network administrator responsible for installing and setting up the DFE modules.

How to Use This Guide

This preface provides an overview of this guide and the DFE-Diamond Series manual set, and a brief summary of each chapter; defines the conventions used in this document; and instructs how to obtain technical support from Enterasys Networks. To locate information about various subjects in this guide, refer to the following table:

For...	Refer to...
An overview of the DFE-Diamond modules	Chapter 1, **Introduction**
Network requirements that must be met before installing the DFE modules	Chapter 2, **Network Requirements**
Instructions to install the DFE module hardware, and optional Mini-GBICs and XENPAK interface modules	Chapter 3, **Installation**
Troubleshooting installation problems and diagnosing network/operational problems using the LANVIEW LEDs	Chapter 4, **Troubleshooting**
Specifications, environmental requirements, and physical properties of the DFE modules, Mini-GBIC interface cards, and XENPAK interface modules	Appendix A, **Specifications**
Instructions to set the mode switches when necessary and to remove and replace DIMM and DRAM SIMM memory	Appendix B, **Mode Switch Settings and Installing Options**

Related Documents

The manuals listed below can be obtained from the World Wide Web in Adobe Acrobat Portable Document Format (PDF) at the following site:

http://www.enterasys.com/support/manuals

- *Enterasys Matrix DFE-Diamond/Platinum Series Configuration Guide* provides information on how to use the Command Line Interface to set up and manage the DFE modules.

- *Enterasys Matrix Network Expansion Module Hardware Installation Guide* provides instructions to install the Enterasys Matrix Network Expansion Modules (NEMs) and Mini-GBICs.

- *Cabling Guide* provides information on dB loss and cable specifications.

  Unlike the *Enterasys Matrix DFE-Diamond/Platinum Series Configuration Guide*, the *Cabling Guide* is not listed alphabetically on the web site. Instead, it is listed under the *Overview Guides* link.

Conventions Used in This Guide

The following conventions are used in this guide:

Note: Calls the reader's attention to any item of information that may be of special importance.

Caution: Contains information essential to avoid damage to the equipment.

Precaución: Contiene información esencial para prevenir dañar el equipo.

Achtung: Verweißt auf wichtige Informationen zum Schutz gegen Beschädigungen.

Electrical Hazard: Warns against an action that could result in personal injury or death due to an electrical hazard.

Riesgo Electrico: Advierte contra una acción que pudiera resultar en lesión corporal o la muerte debido a un riesgo eléctrico.

Elektrischer Gefahrenhinweis: Warnung vor sämtlichen Handlungen, die zu Verletzung von Personen oder Todesfällen – hervorgerufen durch elektrische Spannung – führen können!

Warning: Warns against an action that could result in personal injury or death.

Advertencia: Advierte contra una acción que pudiera resultar en lesión corporal o la muerte.

Warnhinweis: Warnung vor Handlungen, die zu Verletzung von Personen oder gar Todesfällen führen können!

Lowercase x: Indicates the general use of an alphanumeric character (for example, 6x1xx, the x's indicate a combination of numbers or letters).

Getting Help

For additional support related to the modules or this document, contact Enterasys Networks using one of the following methods:

World Wide Web	www.enterasys.com/services/support/
Phone	1-800-872-8440 (toll-free in U.S. and Canada) or 1-978-684-1000
	For the Enterasys Networks Support toll-free number in your country: www.enterasys.com/services/support/contact/
Internet mail	support@enterasys.com
	To expedite your message, type **[SWITCHING]** in the subject line.
To send comments concerning this document to the Technical Publications Department:	
techpubs@enterasys.com	
Please include the document Part Number in your email message.	

Before contacting Enterasys Networks for technical support, have the following information ready:

- Your Enterasys Networks service contract number

- A description of the failure

- A description of any action(s) already taken to resolve the problem (for example, changing mode switches, rebooting the unit)

- The serial and revision numbers of all involved Enterasys Networks products in the network

- A description of your network environment (for example, layout and cable type)

- Network load and frame size at the time of trouble (if known)

- The device history (for example, have you returned the device before, is this a recurring problem)

- Any previous Return Material Authorization (RMA) numbers

1

Introduction

This chapter provides an overview of the DFE-Diamond module capabilities, and introduces the 7GR4270-12, 7GR4202-30, 7GR4280-19, and 7KR4290-02 modules.

Important Notice

Depending on the firmware version used in the DFE module, some features described in this document may not be supported. Refer to the Release Notes shipped with the DFE module to determine which features are supported.

Overview of DFE Series Capabilities

The Diamond Distributed Forwarding Engine (DFE) is Enterasys Networks' next generation of enterprise modules for the Matrix N-Series and Matrix E7 switches. These DFE modules deliver high performance and flexibility to ensure comprehensive switching, routing, Quality of Service, security, and traffic containment. Key features include:

- Enhanced router performance
    - Faster host CPU
    - Enhanced flow capacity
- Included options:
    - Larger host memory (DFE-256MB-UGK)
    - Advanced routing license (N-EOS-L3)
    - 256 users per port capacities license (N-EOS-PPC)
- Superior performance and capacity to support more high-bandwidth and latency sensitive applications
- 10/100/1000 Base-TX and 10 Gigabit Ethernet connectivity
- Integrated services design that reduces the number/type of modules required, simplifies network design, and lowers entry cost
- Port- and user-based policy and multilayer packet classification that provides granular control and security for business-critical applications
- High-availability services with stateful failover for services and management
- Self-learning configuration modules with increased reliability and fault tolerance that reduces configuration time and maximizes uptime
- Network-wide configuration, change, and inventory management that is easier to install, troubleshoot, and maintain
- Reduced support and maintenance costs, and decreased configuration time

The DFE Modules

This section provides an overview of the DFE modules 7GR4270-12 and 7GR4202-30 (Figure 1-1), and 7GR4280-19 and 7KR4290-02 (Figure 1-2). For information about features of the DFE modules and how to configure them, refer to the *Enterasys Matrix DFE-Diamond/Platinum Series Configuration Guide*.

7GR4270-12

The 7GR4270-12 DFE module has 12, 1000BASE-X compliant ports. These ports are Small Form Factor Pluggable (SFP) fixed front panel port slots for Gigabit fiber-optic connections via optional Mini-Gigabit Interface Cards (Mini-GBICs). The 7GR4270-12 DFE module can be installed in a Matrix E7, Matrix N7, Matrix N5, Matrix N3, or Matrix N1 chassis, but only supports FTM2 data backplane interconnections in the Matrix E7 chassis.

7GR4202-30

The 7GR4202-30 DFE module has 30, 10BASE-T/100BASE-TX/1000 BASE-T compliant ports via fixed front-panel RJ45 connectors. The 7GR4202-30 DFE module can be installed in a Matrix E7, Matrix N7, Matrix N5, Matrix N3, or Matrix N1 chassis, but only supports FTM2 data backplane interconnections in the Matrix E7 chassis.

7GR4280-19

The 7GR4280-19 DFE module has 18, 1000BASE-X compliant front-panel ports that support a variety of optional Small Form Factor Pluggable (SFP) Gigabit connections using optional Mini-Gigabit Interface Cards (Mini-GBICs). There is also a slot for an optional network expansion module (NEM).

The 7GR4280-19 can be installed in a Matrix E7, Matrix N7, Matrix N5, Matrix N3, or Matrix N1 chassis, but only supports FTM2 data backplane interconnections in the Matrix E7 chassis. Interconnection from FTM2 to FTM1 can only be accomplished via a bridging module such as the 7H4382-25, 7H4382-49, 7H4383-49, or 7H4385-49.

Each of the front panel ports can operate in either half-duplex or full-duplex mode of operation. The duplex mode can be determined by either auto-negotiation or manual configuration.

Network Expansion Module Option

The 7GR4280-19 option slot provides access to an installed network expansion module (NEM). Refer to the Enterasys Networks web site for a current listing of the available NEMs. Specific installation instructions are shipped with each NEM.

Note: If you are installing a NEM, Enterasys Networks recommends that you install either the **7G-6MGBIC-B** or **7K-2XFP-6MGBIC** module to take advantage of additional flow capacity found in these NEM cards.

7KR4290-02

The 7KR4290-02 DFE module has 2, 10-Gbps Ethernet port slots on the front panel that can support one or two 10-Gbps XENPAK PHYs for high speed uplinks from the chassis DFE Ethernet switch system. With two 10-Gbps PHYs installed in the 7KR4290-02, a shared uplink of up to 10 Gbps can be provided from the DFE switching system to two network edge connections from a Matrix E7, Matrix N7, Matrix N5, Matrix N3, or Matrix N1 chassis to a core data center.

The DFE module ports can be configured to control traffic by limiting the rate of traffic accepted into the module and prioritizing traffic to expedite the flow of higher priority traffic through the module.

The 7KR4290-02 DFE module can be installed in a Matrix E7, Matrix N7, Matrix N5, Matrix N3, or Matrix N1 chassis, but only supports FTM2 data backplane interconnections in the Matrix E7 chassis.

XENPAK 10GBASE-LR, -ER, -LX4, and -SR PHYs

The LAN XENPAK PHYs (physical interfaces) provide inexpensive, high-speed Ethernet connectivity. These PHYs provide network managers the ability to use 10-Gigabit Ethernet technologies to provide high-speed, local backbone interconnections between large capacity switches. As demand for bandwidth increases, network administrators can deploy 10-Gigabit Ethernet throughout the entire network to improve server farm, backbone, and campus-wide connectivity.

Figure 1-1   7GR4270-12 and 7GR4202-30 DFE Modules
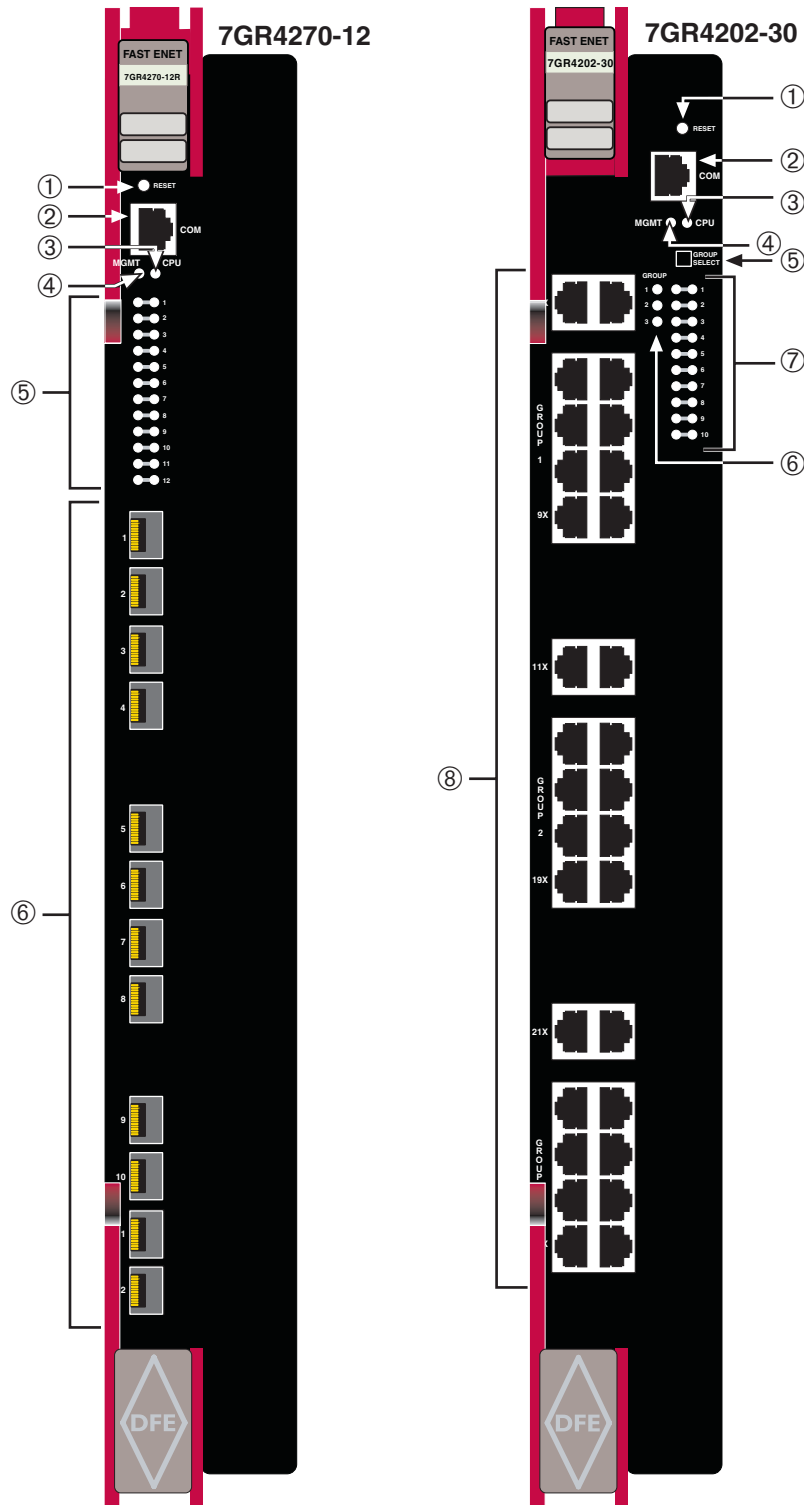
1   RESET switch
2   RJ45 COM (Console Port)
3   CPU LED
4   MGMT LED
5   **7GR4270-12 -** GROUP STATUS LEDs
     7GR4202-30 - GROUP SELECT switch

6   **7GR4270-12** - Port slots (1-12), 1000 Mbps, via Mini-GBICs
     7GR4202-30 - GROUP STATUS LEDs
7   **7GR4202-30 -** GROUP SELECT LEDs
8   **7GR4202-30 -** Ports (1-30), 10/100/1000 Mbps, via RJ45s

Figure 1-2   7GR4280-19 and 7KR4290-02 DFE Modules
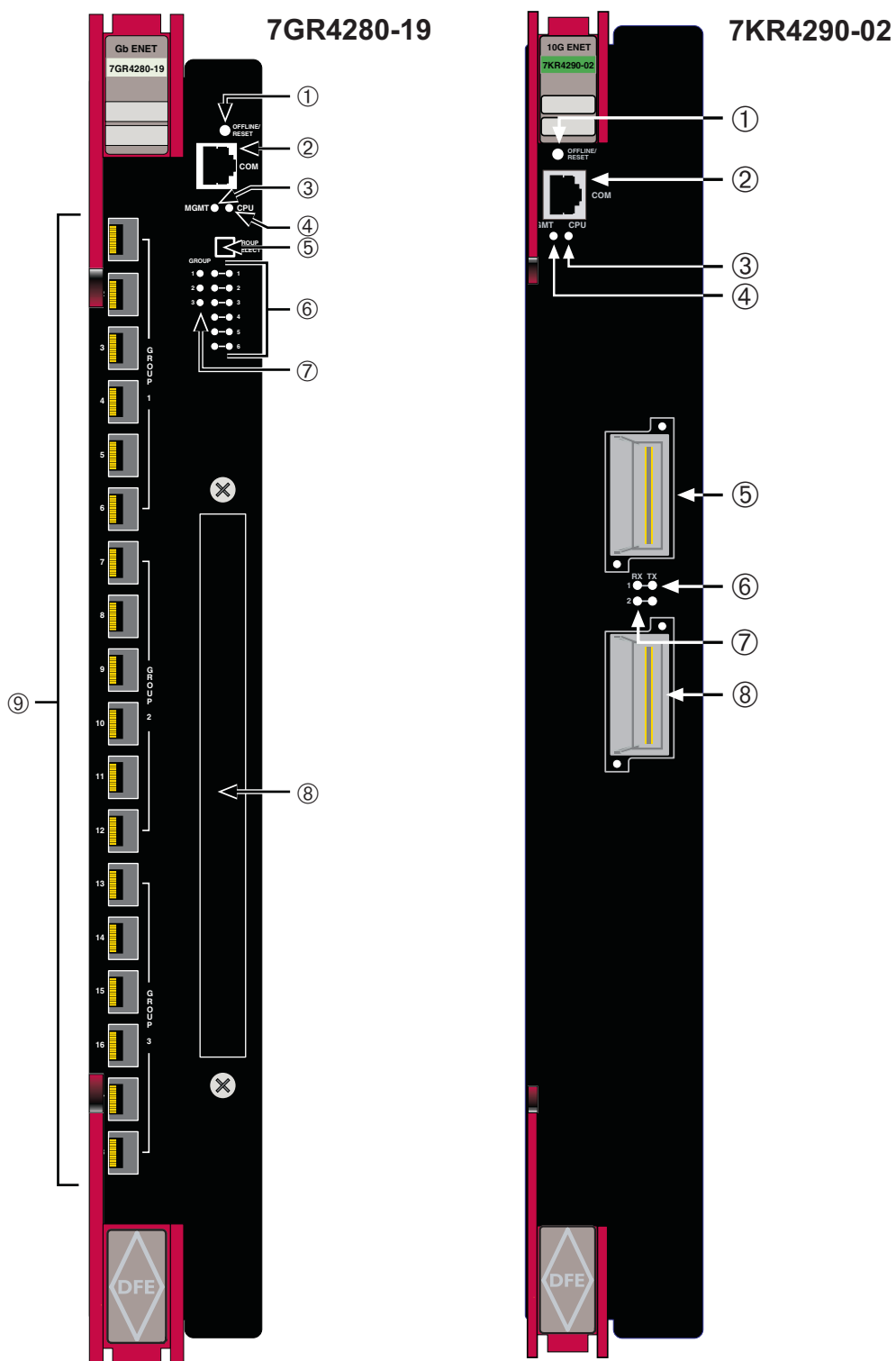
1	OFFLINE/RESET switch	4	**7GR4280-19** - CPU LED 7KR4290-02 - MGMT LED	7	**7GR4280-19** - GROUP SELECT LEDs 7KR4290-02 - RX (receive) LEDs
2	RJ45 COM port	5	**7GR4280-19** - GROUP SELECT switch 7KR4290-02 - XENPAK option slot 1	8	**7GR4280-19** - NEM option slot 7KR4290-02 - XENPAK option slot 2
3	**7GR4280-19** - MGMT LED 7KR4290-02 - CPU LED	6	**7GR4280-19** - GROUP STATUS LEDs 7KR4290-02 - TX (transmit) LEDs	9	**7GR4280-19** - Ports (1-18), 1000 Mbps, through optional MGBICs

Connectivity

> **Note:** The 7GR4270-12, 7GR4202-30, 7GR4280-19, and 7KR4290-02 DFE modules can be installed in a Matrix E7, N7, N5, N3 or N1 chassis, but only support FTM2 data backplane interconnections in the Matrix E7 chassis. Traffic flow from FTM2 to FTM1 can only be accomplished using a bridging module such as the 7H4382-25, 7H4382-49, 7H4383-49, or 7H4385-49.

7GR4270-12

The 7GR4270-12 DFE module has 12 front panel option ports that support 1000BASE-X Gigabit Ethernet through optional Mini-GBICs. For Mini-GBIC specifications, refer to Appendix A.

7GR4202-30

The 7GR4202-30 DFE module has 30, 10BASE-T/100BASE-TX/1000BASE-T compliant ports through fixed front panel RJ45 connectors.

7GR4280-19

The 7GR4280-19 DFE module has 18, 1000BASE-X compliant, Small Form Factor Pluggable (SFP) fixed front-panel port slots for Gigabit Ethernet connections using optional Mini-Gigabit Interface Cards (Mini-GBICs). The port slots enable you to install a mix-and-match number of SFPs to meet a need for various Gigabit Ethernet connections. For Mini-GBIC specifications, refer to Appendix A.

There is also a slot for an optional network expansion module (NEM). Refer to the Enterasys Networks web site for a current listing of the available NEMs. Specific installation instructions are shipped with each NEM.

7KR4290-02

The 7KR4290-02 DFE module has 2, 10-Gbps Ethernet port slots on the front panel that can support one or two 10-Gbps XENPAK PHYs for high speed uplinks from the chassis DFE Ethernet switch system. With two 10-Gbps PHYs installed in the 7KR4290-02, a shared uplink of up to 10 Gbps can be provided from the DFE switching system to two network edge connections from a Matrix E7, N7, N5, N3 or N1 chassis to a core data center. For the XENPAK PHY specifications, refer to Appendix A.

Management

Management of the module can be either in-band or out-of-band. In-band remote management is possible using Telnet, Enterasys Networks' NetSight® management application, or WebView™ application. Out-of-band management is provided through the RJ45 COM (Communication) port on the front panel using a VT100 terminal or a VT100 terminal emulator.

Switch Configuration Using WebView

Enterasys Networks' HTTP-based Web management application (WebView) is an intuitive web tool for simple management tasks.

Switch Configuration Using CLI Commands

The CLI commands enable you to perform more complete switch configuration management tasks.

For CLI command set information and how to configure the module, refer to the *Enterasys Matrix DFE-Diamond/Platinum Series Configuration Guide*.

Secure Networks Policy Support

A fundamental concept that is key to the implementation of the Enterasys Secure Networks methodology is policy-enabled networking. This approach provides users of the network with the resources they need - in a secure fashion – while at the same time denying access to applications or protocols that are deemed inappropriate based on the user's function within the organization. By adopting such a "user-personalized" model, it is possible for business policies to be the guidelines in establishing the technology architecture of the enterprise. Two major objectives are achieved in this way: IT services are matched appropriately with individual users; and the network itself becomes an active participant in the organization's security strategy. The Secure Networks architecture consists of three tiers:

- Classification rules make up the first or bottom tier. The rules apply to devices in the Secure Networks environment, such as switches and routers. The rules are designed to be implemented at or near the user's point of entry to the network. Rules may be written based on criteria defined in the Layer 2, Layer 3 or Layer 4 information of the data frame.

- The middle tier is Services, which are collections of individual classification rules, grouped logically to either permit or deny access to protocols or applications based on the user's role within the organization. Priority and bandwidth rate limiting may also be defined in services.

- Roles, or behavioral profiles, make up the top tier. The roles assign services to various business functions or departments, such as executive, sales, and engineering.

To enhance security and deliver a true policy-based infrastructure, the Enterasys Secure Networks methodology can take advantage of authentication methods, such as 802.1X, using EAP-TLS, EAP-TTLS, or PEAP, as well as other types of authentication. Authorization information, attached to the authentication response, determines the application of policy. Authorization information is communicated via the policy name in a RADIUS Filter-ID attribute. An administrator can also define a role to be implemented in the absence of an authentication framework. Refer to the release notes shipped with the module for details.

Standards Compatibility

The DFE modules are fully compliant with the IEEE 802.3-2002, 802.3ae-2002, 802.1D-1998, and 802.1Q-1998 standards. The DFE modules provide IEEE 802.1D-1998 Spanning Tree Algorithm (STA) support to enhance the overall reliability of the network and protect against "loop" conditions.

LANVIEW Diagnostic LEDs

LANVIEW diagnostic LEDs serve as an important troubleshooting aid by providing an easy way to observe the status of individual ports and overall network operations. For more information about LEDs, refer to Chapter 4, **Troubleshooting**.

2

Network Requirements

Before installing the module, review the requirements and specifications referred to in this chapter concerning the following:

The network installation must meet the requirements to ensure satisfactory performance of this equipment. Failure to do so will produce poor network performance.

> **Note:** The *Enterasys Matrix DFE-Diamond/Platinum Series Configuration Guide* and the *Cabling Guide* referred to in the following sections can be found on the Enterasys Networks World Wide Web site: http://www.enterasys.com/support/manuals/
>
> Refer to "Related Documents" in **About This Guide**.

Link Aggregation

Link Aggregation is a method of grouping multiple physical ports on a network device into one logical link according to the IEEE 802.3ad-2002 standard. Because Link Aggregation is standards based, it allows for automatic configuration with manual overrides (if applicable), and can operate on 10 Mbps, 100 Mbps, or 1000 Mbps Ethernet full duplex ports. Thus the network administrator can combine a group of five 100 Mbps ports into a logical link (trunk) that functions as a single 500 Mbps port. As long as the DFE modules agree on which ports are in the trunk, there are no problems with looping, and the Spanning Tree can treat this trunk as a single port.

In normal usage (and typical implementations) there is no need to enable/disable ports for Link Aggregation. The default values will result in the maximum number of aggregations possible. If the switch is placed in a configuration with its peers not running the protocol, no aggregations will be formed and the DFE modules will function normally (that is, Spanning Tree will block redundant paths).

For details about the commands involved with configuring the Link Aggregation function, refer to the *Enterasys Matrix DFE-Diamond/Platinum Series Configuration Guide*.

Module Placement in a Matrix E7 Chassis

If you want to mix 6x1xxx, 6x2xxx, 6x3xxx, and 7H43xx-xx series modules in the same Matrix E7 chassis, it is necessary to have a DFE bridging module such as the 7H4382-25, 7H4382-49, 7H4383-49, or 7H4385-49 installed and to also follow the module placement rules described in "Installing Module into Matrix E7 or N7 Chassis" on page 3-10 to successfully bridge data traffic to some or all modules in the chassis.

10BASE-T Network

When connecting a 10BASE-T segment to any of the fixed front panel ports of the 7GR4202-30, ensure that the network meets the Ethernet network requirements of the IEEE 802.3-2002 standard for 10BASE-T. Refer to the *Cabling Guide* for details.

> **Note:** If a port is to operate at 100 Mbps, Category 5 cabling must be used. Category 3 cabling does not meet 100 Mbps specifications. For 10 Mbps operation only, Category 3 or Category 5 cabling can be used. Refer to "100BASE-TX Network" on page 2-2 for information about 100BASE-TX networks and cabling.

100BASE-TX Network

The fixed front panel ports of the 7GR4202-30 provide a connection that supports Category 5 UTP cabling. The device at the other end of the twisted pair segment must meet IEEE 802.3-2002 100BASE-TX Fast Ethernet network requirements for the devices to operate at 100 Mbps. Refer to the *Cabling Guide* for details.

> **Note:** The fixed ports of the module support Category 5 UTP cabling with an impedance between 85 and 111 ohms for 100 Mbps operation. The module is capable of operating at 10, 100, or 1000 Mbps and can automatically sense the port speed of the other device and adjust its speed accordingly.

1000BASE-T Network

The 7GR4202-30 DFE module provides 30 ports that support 10/100/1000 Mbps via RJ45 front panel connectors. These connections support copper wire connections that can operate up to 1000 Mbps. The device at the other end of the twisted pair segment must meet IEEE 802.3-2002 10/100/1000 BASE-T network requirements for the devices to operate at Gigabit speed.

> **Note:** The fixed ports of the module support Category 5 UTP cabling with an impedance between 85 and 111 ohms for 100 and 1000 Mbps operation.
>
> Front-panel ports 1 through 30 are capable of operating at either 10, 100, or 1000 Mbps. The module automatically senses the speed of the other device and adjusts its speed accordingly.

1000BASE-SX/LX Network

The optional Mini-GBICs installed in the 7GR4270-12 port slots 1 through 12, or in the 7GR4280-19 front-panel ports 1 through 18 or the optional NEM, provide fiber-optic connections operating at 1000 Mbps (1 Gbps). Other Mini-GBICs may support different types of cabling connections. The device at the other end of the fiber-optic connection must meet IEEE 802.3-2002 Gigabit Ethernet requirements for the devices to operate at Gigabit speed. Refer to Appendix A for further details on Mini-GBIC specifications.

XENPAK 10-Gigabit Ethernet

There are two optional 10-Gigabit interface port slots on the 7KR4290-02 that can support various optional XENPAK 10-Gigabit Ethernet (10 GbE) standard type fiber-optic modules. As of the printing of this guide, the 10GBASE-LR, -ER, -LX4, and -SR are available.

Table 2-1 provides the cable type, maximum length, and connector type according to each version of XENPAK. For complete specifications, refer to "10GBASE XENPAK PHY Specifications" on page A-6.

Table 2-1   Recommended Cable Types and Specifications

XENPAK PHY	Type	Max. Length	Connector
10GBASE-LR	SMF	10 km (6.21 mi)	SC
10GBASE-ER[1]	SMF	40 km (24.85 mi)	SC
10GBASE-LX4	SMF MMF	10 km (6.21 mi) 300 m (984.25 ft)	SC
10GBASE-SR	62.5 um MMF 200 Mhz/km 50 um MMF 400 Mhz/km 50 um MMF 2000 Mhz/km	33 m (108 ft) 66 m (217 ft) 300 m (884 ft)	SC SC SC

1. The 10GBASE-ER XENPAK requires a minimum of 5 dB attenuation or a cable length of about 10 km.

The uplinks have one fiber-optic interface with an SC connector. Depending on the XENPAK and fiber-optic cable used, the signal can be driven to a maximum distance of 33 m (108 ft) to 40 km (24.85 miles).

The device at the other end of the fiber optic connection must be a standards-compliant product with a matching XENPAK interface.

3

Installation

⚠ **Electrical Hazard:** Only qualified personnel should perform installation procedures.

Riesgo Electrico: Solamente personal calificado debe realizar procedimientos de instalacion.

Elektrischer Gefahrenhinweis: Installationen sollten nur durch ausgebildetes und qualifiziertes Personal vorgenommen werden.

Important Notice

Read the Release Notes shipped with the DFE module to check for any exceptions to the supported features and operation documented in this guide.

This chapter provides the instructions to install the 7GR4270-12, 7GR4202-30, 7GR4280-19, and 7KR4290-02 DFE modules, and optional Mini-GBICs and XENPAK interface modules.

📝 **Note:** Unless otherwise noted, the installation instructions for the DFE modules apply to all DFE modules.

Follow the order of the sections listed below to correctly install the DFE module.

Required Tools

Tools needed to install the DFE modules and options include:

- Phillips screwdriver
- Flat blade screwdriver

Unpacking the DFE Module

Unpack the DFE module as follows:

1. Open the box and remove the packing material protecting the DFE module.

2. Verify the contents of the carton as listed in Table 3-1.

Table 3-1   Contents of Module Carton

Item	Quantity
DFE Module (7GR4270-12, 7GR4202-30, 7GR4280-19, or 7KR4290-02)	1
Installation Guide	1
Customer Release Notes	1

3. Remove the tape seal on the non-conductive bag to remove the DFE module.

4. Perform a visual inspection of the DFE module for any signs of physical damage. Contact Enterasys Networks if there are any signs of damage. Refer to "Getting Help" on page xv for details.

Installing Optional Network Expansion Modules (NEMs)

Note: Install any optional equipment before proceeding to "Backplane Connections and Installation Rules" on page 3-8 for an explanation of the rules to install different series modules in a Matrix E7 chassis.

Refer to your release notes or the Enterasys Networks web site for the latest available network expansion modules.

Installing a NEM involves

- removing the coverplate from the DFE module,
- installing the NEM, and
- installing the Mini-GBICs.

Refer to the installation instructions shipped with the NEM for details.

Note: If you are installing a NEM, Enterasys Networks recommends that you install either the **7G-6MGBIC-B** or **7K-2XFP-6MGBIC** module to take advantage of additional flow capacity found in these NEM cards.

Installing Optional Mini-GBICs

This section describes how to install a Mini-GBIC in any of the 7GR4270-12 front panel ports (1-12) or the 7GR4280-19 front panel ports (1-18) or in an optional NEM. For a list of supported Mini-GBICs and their specifications, refer to "Mini-GBIC Input/Output Specifications" on page A-3.

> ⚠️ **Warning:** Fiber-optic Mini-GBICs use Class 1 lasers. Do not use optical instruments to view the laser output. The use of optical instruments to view laser output increases eye hazard. When viewing the output optical port, power must be removed from the network adapter.
>
> **Advertencia:** Los Mini-GBICS de fibra optica usan lasers de clase 1. No se debe usar instrumentos opticos para ver la potencia laser El uso de los instrumentos opticos para ver la potencia laser incrementa el riesgo a los ojos. Cuando vean el puerto de la potencia optica, la corriente debe ser removida del adaptador de la red.
>
> **Warnhinweis:** Mini-GBICs mit Fiber-Optik Technologie benutzen Laser der Klasse 1. Benutzen sie keinesfalls optische Hilfsmittel, um die Funktion des Lasers zu überprüfen. Solche Hilfsmittel erhöhen die Gefahr von Sehschäden. Wenn sie den optischen Port überprüfen möchten stellen Sie sicher, dass die Komponente von der Spannungsversorgung getrennt ist.

> ⚠️ **Caution:** Carefully follow the instructions in this manual to avoid damaging the Mini-GBIC, NEM, and DFE module.
>
> The Mini-GBIC, NEM, and DFE module are sensitive to static discharges. Use an antistatic wrist strap and observe all static precautions during this procedure. Failure to do so could result in damage to the Mini-GBIC, NEM, and DFE module. Always leave the Mini-GBIC in the antistatic bag or an equivalent antistatic container when not installed.
>
> **Precaución:** Siga las instrucciones del manual para no dañar el Mini- GBIC, NEM ni el módulo DFE, puesto que son muy sensible a las descargas de electricidad estática.
>
> Utilice la pulsera antiestática y tome todas las precauciones necesarias durante este procedimiento. Si no lo hace, podría dañar el Mini- GBIC, NEM o el módulo DFE. Mientras no esté instalado, mantenga el Mini- GBIC en su bolsa antiestática o en cualquier otro recipiente antiestático.

Preparation

Before installing the Mini-GBIC, proceed as follows:

1. Attach the antistatic wrist strap (refer to the instructions in the antistatic wrist strap package) before removing the Mini-GBIC from the antistatic packaging.

2. Remove the Mini-GBIC from the packaging.

3. If there is a protective dust cover (see in Figure 3-1 or Figure 3-2) on the Mini-GBIC port, do not remove it at this time.

Installation

To install a Mini-GBIC with an MT-RJ connection, refer to Figure 3-1, for an LC connection, refer to Figure 3-2, or for an RJ45 connection, refer to Figure 3-3, and proceed as follows:

1. Hold the Mini-GBIC with its top side facing up and its 7-pin edge connector facing the port slot.

2. Carefully align the Mini-GBIC with the port slot.

3. Push the Mini-GBIC into the port slot until the Mini-GBIC "clicks" and locks into place.
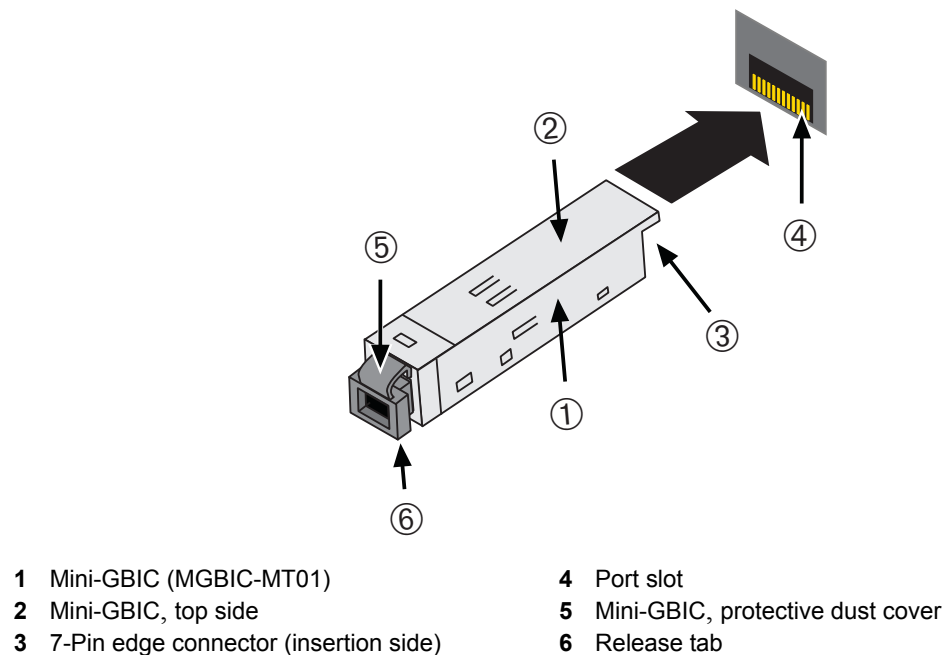
Figure 3-1   Mini-GBIC with MT-RJ Connector

1	Mini-GBIC (MGBIC-MT01)	**4**	Port slot
2	Mini-GBIC, top side	**5**	Mini-GBIC, protective dust cover
3	7-Pin edge connector (insertion side)	**6**	Release tab

Figure 3-2   Mini-GBIC with LC Connector

1	Mini-GBIC (MGBIC-LC01 or MGBIC-LC09)	**4**	Port slot
2	Mini-GBIC, top sid	**5**	Mini-GBIC, protective dust cover
3	7-Pin edge connector (insertion side)	**6**	Release tab
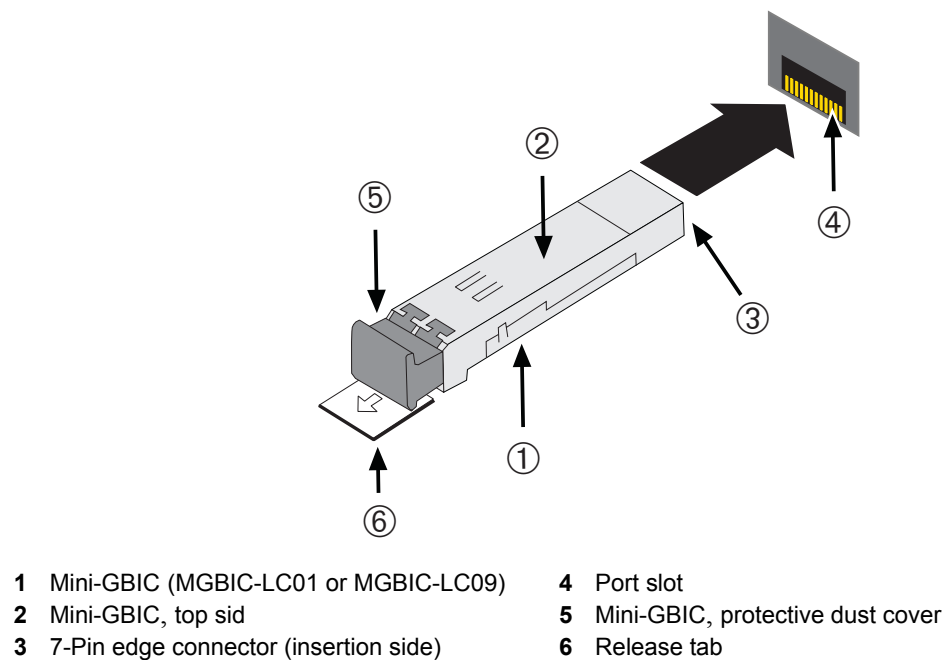
Figure 3-3   Mini-GBIC with RJ45 Connector
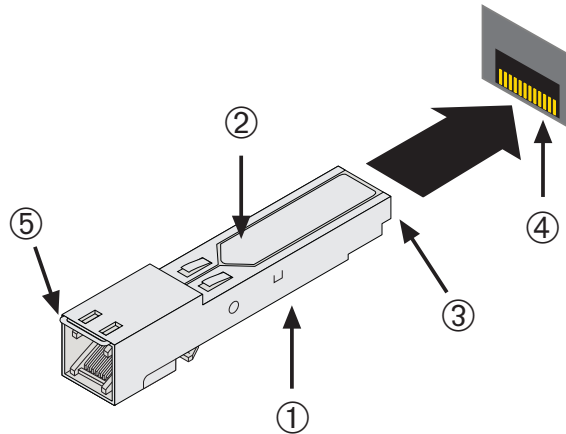
1	Mini-GBIC (MGBIC-02)	**4**	Port slot
2	Mini-GBIC, top side	**5**	Wire-handle release
3	7-Pin edge connector (insertion side)		

Removing the Mini-GBIC

To remove a Mini-GBIC from a port slot, proceed as follows:

Caution: Do NOT remove a Mini-GBIC from a slot without releasing the locking tab located under the front bottom end of the Mini-GBIC. This can damage the Mini-GBIC.

The Mini-GBIC and its host device are sensitive to static discharges. Use an antistatic wrist strap and observe all static precautions during this procedure. Failure to do so could result in damaging the Mini-GBIC or host device. Always leave the Mini-GBIC in the antistatic bag or an equivalent antistatic container when not installed.

Precaución: NO quite el Mini- GBIC de la ranura sin antes abrir la traba ubicada en la parte frontal del Mini- GBIC.

Si lo hace, puede dañar el Mini- GBIC, puesto que es muy sensible a las descargas de electricidad estática, al igual que el dispositivo host. Utilice la pulsera antiestática y tome todas las precauciones necesarias durante este procedimiento. Si no lo hace, pude dañar el Mini- GBIC o el dispositivo host. Mientras no esté instalado, mantenga el Mini- GBIC en su bolsa antiestática o en cualquier otro recipiente antiestático.

1. Attach the antistatic wrist strap (refer to the instructions in the antistatic wrist strap package) before removing the Mini-GBIC.

2. Remove the cables connected to the Mini-GBIC.

3. Release the Mini-GBIC from the port slot. Refer back to the appropriate figure listed below to locate the release mechanism and proceed as instructed.

   – For the type of Mini-GBIC shown in Figure 3-1, push in on the release tab as far as it will go to release the Mini-GBIC.

   – For the type of Mini-GBIC shown in Figure 3-2, pull out on the release tab to release the Mini-GBIC.

   – For the type of Mini-GBIC shown in Figure 3-3, pull down on the wire handle to release the Mini-GBIC.

4. Grasp the sides of the Mini-GBIC and pull it straight out of the port slot.

If storing or shipping the Mini-GBIC, insert its dust protector to protect its fiber-optic ports.

Installing an Optional XENPAK Module

This section describes how to install a XENPAK module into the 7KR4290-02 DFE module. For the XENPAK specifications, refer to Appendix A.

Caution: Carefully follow the instructions in this manual to avoid damaging the XENPAK module and 7KR4290-02.

The XENPAK module and 7KR4290-02 are sensitive to static discharges. Use an antistatic wrist strap and observe all static precautions during this procedure. Failure to do so could result in damage to the XENPAK module and 7KR4290-02. Always leave the XENPAK module in the antistatic bag or an equivalent antistatic container when not installed.

Precaución: Siga las instrucciones del manual para no dañar el XENPAK ni el módulo 7KR4290-02, puesto que son muy sensible a las descargas de electricidad estática. Utilice la pulsera antiestática y tome todas las precauciones necesarias durante este procedimiento. Si no lo hace, podría dañar el XENPAK ni el módulo 7KR4290-02. Mientras no esté instalado, mantenga el XENPAK en su bolsa antiestática o en cualquier otro recipiente antiestático.
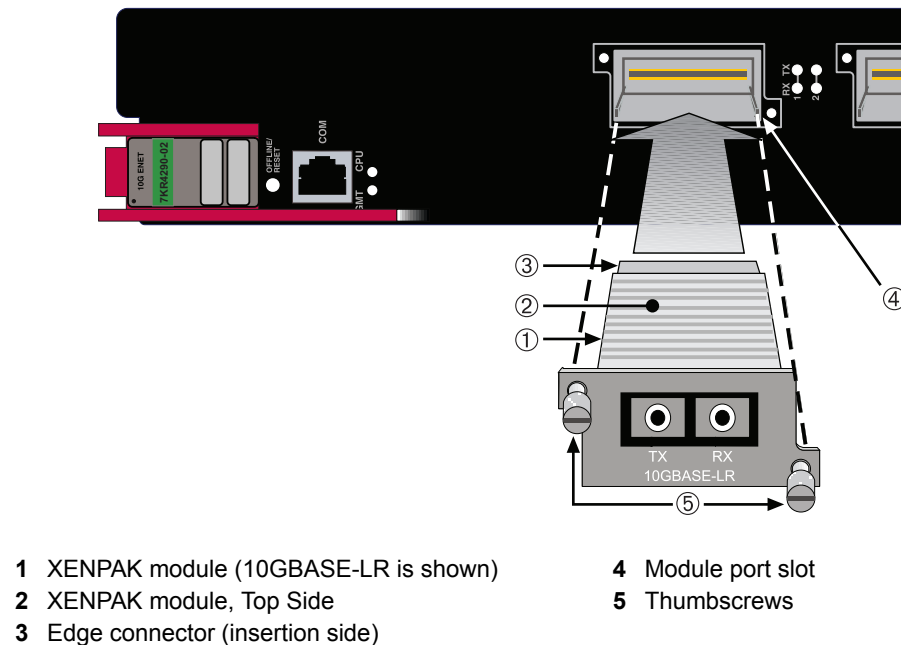
Preparation

Before installing the XENPAK module, proceed as follows:

1. Attach the antistatic wrist strap (refer to the instructions in the antistatic wrist strap package) before removing the XENPAK module from the antistatic packaging.

2. Remove the XENPAK module from the packaging.

Installation

To install a XENPAK module, refer to Figure 3-4 and proceed as follows:

1. Hold the XENPAK module with the top side facing up (as shown in Figure 3-4) and its edge connector facing the port slot.

2. Carefully align the XENPAK module with the port slot.

3. Push the XENPAK module into the 7KR4290-02 port slot until the back of the XENPAK module faceplate is flush against the 7KR4290-02 front panel.

4. Turn the two thumbscrews clockwise and tighten to secure the XENPAK module to the front panel. This completes the XENPAK module installation.

Figure 3-4   XENPAK Module Installation

1	XENPAK module (10GBASE-LR is shown)	**4**	Module port slot
2	XENPAK module, Top Side	**5**	Thumbscrews
3	Edge connector (insertion side)		

Removing a XENPAK Module

> ⚠ **Caution:** The XENPAK module and 7KR4290-02 are sensitive to static discharges. Use an antistatic wrist strap and observe all static precautions during this procedure. Failure to do so can result in damage to the XENPAK module and 7KR4290-02. Always leave the XENPAK module in the antistatic bag or an equivalent antistatic container when not installed.
>
> **Precaución:** Si lo hace, puede dañar el XENPAK ni el módulo 7KR4290-02, puesto que es muy sensible a las descargas de electricidad estática, al igual que el dispositivo host. Utilice la pulsera antiestática y tome todas las precauciones necesarias durante este procedimiento. Si no lo hace, pude dañar el XENPAK ni el módulo 7KR4290-02 o el dispositivo host. Mientras no esté instalado, mantenga el XENPAK en su bolsa antiestática o en cualquier otro recipiente antiestático.

To remove a XENPAK module from the 7KR4290-02, refer back to Figure 3-4 and proceed as follows:

1. Attach the antistatic wrist strap (refer to the instructions in the antistatic wrist strap package) before removing the XENPAK module.

2. Remove any network cable (not shown) connected to the SC connector on the XENPAK module. To remove an SC cable connector from theXENPAK module interface port, carefully pull the connector out of the port. It may need to be loosened by gently moving it from side to side to release the latching keys. For more information about an SC cable connection, refer to "Connecting to the Network" on page 3-13.

3. Turn the thumbscrews counterclockwise to release the XENPAK module from the 7KR4290-02 front panel.

4. Grasp the thumbscrews and pull the XENPAK module straight out of the 7KR4290-02 port slot.

5. Before storing or shipping the XENPAK module, insert it into a static-free container. This completes the removal procedure.

Backplane Connections and Installation Rules

> **Note:** A lowercase x indicates the general use of an alphanumeric character (e.g., 6x1xx, the x's indicate a combination of numbers or letters).

The following sections describe the FTM1 and FTM2 backplane connections, and the hardware configuration rules when installing first (6x1xx), second (6x2xx), third (6x3xx), and fourth (7xxxxx) generation modules into the same Matrix E7 chassis.

FTM1 and FTM2 Connectivity

The Matrix E7 (6C107) chassis has backplanes referred to as FTM1 and FTM2. The 7xxxxx DFE modules use FTM2 for high speed communication to each other and operate as one switching unit with a single IP address. The traffic through these modules does not connect to FTM1 except through an FTM bridging module such as the 7H4382-25, 7H4382-49, 7H4383-49, or the 7H4385-49.

The 7H4382-49 has a connection to both FTM1 and FTM2 backplanes, which enables the 7H4382-49 to switch frames between the two backplanes and all modules in the 6C107 chassis. However, the older first (6x1xx), second (6x2xx), and third (6x3xx) generation modules are still managed using their own Local Management and are not subject to management by the DFE module management entity.

The Matrix N1 (7C111), Matrix N3 (7C103) and Matrix N7 (7C107) chassis have only FTM2 connections and support only DFE modules. The Matrix N5 (7C105-P) has FTM2 connections and also supports PoE-compliant DFE modules.

Module Placement and Rules

Depending on the modules being installed in the Matrix E7 chassis and to help ensure proper operation, consider the following examples and rules for module placement in the chassis. Figure 3-5 shows five examples of chassis module placement. These examples are described below along with the applicable module placement rule.

The Matrix N1, Matrix N3, Matrix N5, and Matrix N7 chassis support only DFE Series modules and there are no particular rules for installing modules.

Figure 3-5   Examples, Module Placement in Matrix E7 Chassis
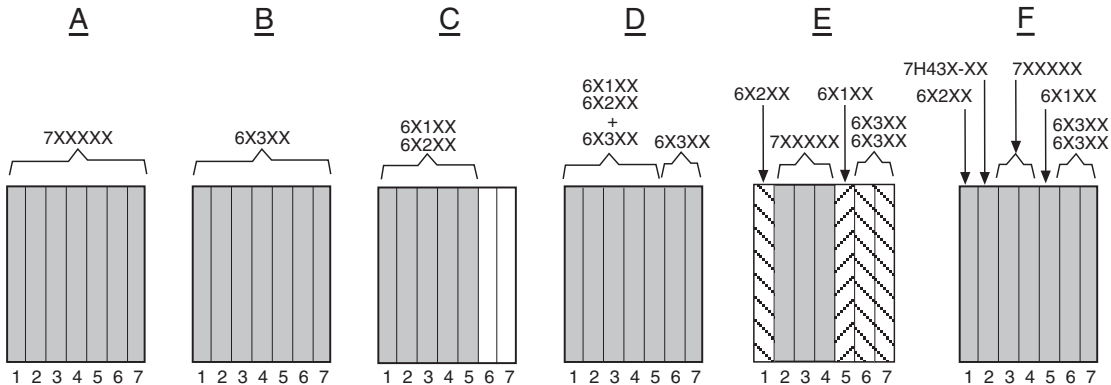
Example 1 (Figure 3-5, A)

Shows the chassis fully populated with DFE modules (7xxxxx). These modules communicate with each other via the FTM2 chassis backplane and act as a single switching entity with one IP address. The DFE modules are configured using a Command Line Interface set of commands.

Rule: DFE modules can be installed in any available chassis slot in the Matrix E7 chassis.

Example 2 (Figure 3-5, B)

Shows the chassis fully populated with third generation modules (6x3xx). These modules can also be installed in any available chassis slot in the Matrix E7 chassis, but operate as individual modules with separate IP addresses. Each module is configured using Local Management.

Rule: The 6x3xx modules can be installed in any available chassis slot in the Matrix E7 chassis.

Example 3 (Figure 3-5, C)

Shows chassis slots 1 through 5 populated with first and second generation modules (6x1xx and 6x2xx). If a 6x1xx or 6x2xx series module is installed in slot 6 or 7, it will operate in standalone mode (no backplane connectivity). Like the 6x3xx modules, the 6x1xx and 6x2xx modules operate as individual modules with separate IP addresses, and each one is configured using Local Management.

Rule: The 6x1xx and 6x2xx modules can communicate with each other when they are installed in chassis slots 1 through 5 in the Matrix E7 chassis. If installed in slot 6 or 7, they operate in standalone mode.

Example 4 (Figure 3-5, D)

Shows chassis slots 1 through 5 populated with a mix of 6x1xx, 6x2xx, and 6x3xx modules and only third generation modules in slots 6 and 7.

In this module arrangement, the 6x3xx module provides a proxy bridge, which enables the 6x1xx and 6x2xx modules to communicate with 6x3xx modules in slot 6 or 7. If more than one 6x3xx module is installed in slots 1 to 5, the module in the lowest numbered slot performs the proxy function for slots 6 and 7. Therefore, if a 6x3xx module is already performing the proxy function, and another 6x3xx module is inserted into a lower numbered slot, connectivity will be temporarily interrupted, as the new board takes over the proxy function. When a 6x3xx module in a lower numbered slot is removed, and there is a 6x3xx module in a higher numbered slot, communication is not interrupted.

For Local Management, plugging the Local Management connection into the 6x3xx modules will allow management connections to all 6x1xx, 6x2xx, and 6x3xx modules. If the Local Management connection is to a 6x1xx or 6x2xx board, only the modules in the first five slots will be recognized by the management client.

Rule: There must be at least one 6x3xx module in slots 1 through 5 to enable communications between the 6x1xx, 6x2xx, and 6x3xx modules.

Example 5 (Figure 3-5, E)

Shows chassis slots 1 and 5 populated with 6x1xx, 6x2xx modules, respectively; slots 2 through 4 with DFE modules, but not a bridging module (such as the 7H4382-25, 7H4382-49, 7H4383-49, or 7H4385-49); and slots 6 and 7 with 6x3xx modules.

In this module arrangement, the 6x1xx and 6x2xx modules in slots 1 and 5 can only communicate with each other, because there is no 6x3xx module in one of the first five slots to serve as the proxy bridge to communicate with the 6x3xx modules in slots 6 and 7. The 7x4xxx DFE modules in slots 2, 3, and 4 will operate under one IP address. Since there is no bridging module, the DFE modules will not communicate with any other modules in the chassis.

Rule: In this example, there must be at least one 6x3xx series module, and a 7H4382-25, 7H4382-49, 7H4383-49, or 7H4385-49 bridging module in slots 1 through 5 to enable communications between all generations of modules in the chassis.

Example 6 (Figure 3-5, F)

The module arrangement in this example is similar to the one shown in Figure 3-5, **E** and described in Example 5. The only difference is that a 7H4382-49 bridging module is installed in slot 2, enabling all modules to communicate with each other.

Rule: In this example, the 7H4382-49 serves as both the FTM1-to-FTM2 bridge and the five-to-seven slot proxy bridge. The 6x3xx does not serve as a proxy bridge in this configuration because the 7H4382-49 is in a slot with a lower number. You can use the 7H4382-25, 7H4382-49, 7H4383-49, or 7H4385-49 as a bridging module depending on the need.

Installing Module into Matrix E7 or N7 Chassis

Caution: Failure to observe static safety precautions could cause damage to the module. Follow static safety handling rules and wear the antistatic wrist strap.

Do not cut the non-conductive bag to remove the module. Sharp objects contacting the board or components can cause damage.

Precaución: Si no toma las medidas de seguridad necesarias para evitar descargas de electricidad estática, es posible que el módulo se dañe. Siga los consejos de seguridad para la manipulación del producto y no olvide utilizar la pulsera antiestática.

No corte la bolsa antiestática para sacar el módulo. Tenga en cuenta que si algún objeto cortante entra en contacto con la placa o con los componentes, éstos podrían dañarse.

To install any module into the Matrix E7 or N7 chassis, refer to "Backplane Connections and Installation Rules" on page 3-8 to familiarize yourself with the FTM1 and FTM2 backplane connections and the module hardware installation rules. Then proceed to "Installing Module into Matrix E7 or N7 Chassis" on page 3-10 to start the installation process.

To install a DFE module into a Matrix N3, N1, or N5 chassis, proceed directly to "Installing Module into Matrix N3, N1, or N5 Chassis" on page 3-12 to start the installation process.

Preparation

1. Remove the blank panel covering the slot in which the module will be installed. All other slots must remain covered to ensure proper airflow for cooling. (Save the blank plate in the event you need to remove the module.)

2. Remove the module from the shipping box. (Save the box and packing materials in the event the module needs to be reshipped.)

3. Locate the antistatic wrist strap shipped with the chassis. Attach the antistatic wrist strap to your wrist and plug the cable from the antistatic wrist strap into the ESD grounding receptacle at the upper right corner of the chassis.

4. Remove the module from the plastic bag. (Save the bag in the event the module must be reshipped.) Observe all precautions to prevent damage from Electrostatic Discharge (ESD).

5. Examine the module for damage. If any damage exists, DO NOT install the module. Immediately contact Enterasys Networks. Refer to "Getting Help" on page xv.

Installation

To install the module, refer to Figure 3-6 and proceed as follows:

Caution: To prevent damaging the backplane connectors in the following step, take care that the module slides in straight and properly engages the backplane connectors.

Ensure that the top lever lines up with the desired slot number located on the front panel of the chassis. Refer to Figure 3-6.

Precaución: Para evitar que se dañen los conectores del panel posterior en el siguiente paso, intente deslizar el módulo en forma recta y verifique que se enganche correctamente en los conectores de panel posterior.

Asegúrese de que la palanca superior esté alineada con respecto al número de ranura correspondiente ubicado en el panel frontal del chasis. Consulte en Figure 3-6.

1. Locate the chassis card guides that line up with the slot number in which the module will be installed. Make sure the module locking levers are in the open position (top and bottom).

2. Align the module card between the upper and lower card guides of the desired slot and slide it into the chassis, taking care that the module slides in straight. See Caution below.

Caution: Due to the amount of force needed to properly seat the module connectors into the backplane connectors, it is best to apply force to the end of the levers to insert (or eject) the module. Otherwise, damage could result to the module and chassis.

Precaución: Para colocar los conectores del módulo en los conectores del panel posterior correctamente es necesario hacer bastante fuerza, por ello, para insertar o quitar el módulo, se recomienda concentrar la fuerza en el extremo de las palancas. Si no lo hace, podría dañar el módulo y el chasis.

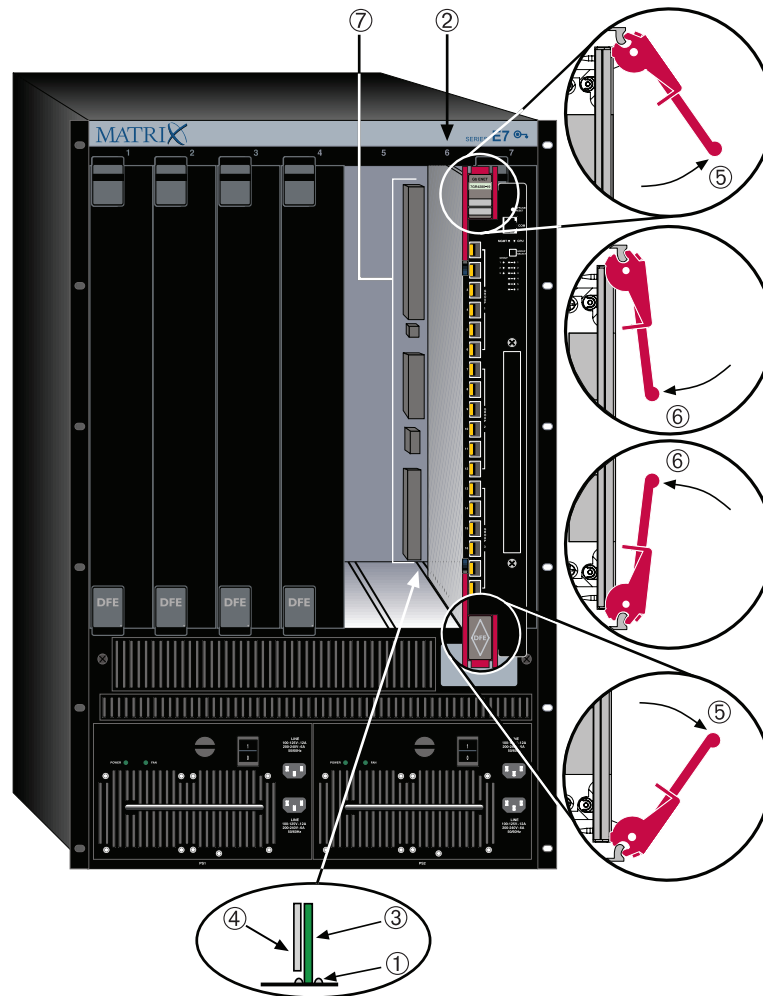3. Slide the module into the slot until you can engage the top and bottom locking levers.

Caution: In step 4, do not force the locking levers to the point that they touch the face of the front panel. Forcing the locking levers to this point could damage the module and chassis.

Precaución: En el paso 4, tenga cuidado de no llevar las palancas de cierre a un punto en donde estén en contacto con el panel frontal. Si lo hace, podría dañar el módulo y/o el chasis.

4. Refer to the Caution note above, then rotate the two levers into the closed position.

5. If the chassis in which the module is installed was powered down for the installation, turn the power supplies on. Check to see that the module CPU LED settles at solid green after a few minutes. If the LED does not turn solid green, refer to Chapter 4 for troubleshooting details.

Figure 3-6   Installing Module into Matrix E7 or N7 Chassis (Matrix E7 shown)

1	Card guides	**7**	Backplane connectors
2	Slot number 6 (Left-most slot is 1)		• Top two connectors (power and FTM2)
3	Module card		• Bottom two connectors (power and FTM1)
4	Metal back panel		(no bottom connectors in Matrix N7
5	Upper/lower locking tabs (in proper open position)		chassis)
6	Upper/lower locking tab (in closed position)		

Installing Module into Matrix N3, N1, or N5 Chassis

⚠️ **Caution:** Failure to observe static safety precautions could cause damage to the module. Follow static safety handling rules and wear the antistatic wrist strap.

Do not cut the non-conductive bag to remove the module. Sharp objects contacting the board or components can cause damage.

Precaución: Si no toma las medidas de seguridad necesarias para evitar descargas de electricidad estática, es posible que el módulo se dañe. Siga los consejos de seguridad para la manipulación del producto y no olvide utilizar la pulsera antiestática.

No corte la bolsa antiestática para sacar el módulo. Tenga en cuenta que si algún objeto cortante entra en contacto con la placa o con los componentes, éstos podrían dañarse.

A DFE module can be installed in any available chassis slot: 1 through 3 in the Matrix N3 chassis, the single slot of the N1 chassis, or 1 through 5 in the Matrix N5 chassis. All chassis have horizontal slots for DFE modules. To install a DFE module into the Matrix N3, N1, or N5 chassis, refer to Figure 3-7 and use the installation procedure described in "Installing Module into Matrix E7 or N7 Chassis" on page 3-10.

⚠️ **Caution:** When setting the locking levers to the closed position, do not try to force the locking levers to the point that they touch the face of the front panel. Forcing the locking levers to this point could damage the module and chassis.

Precaución: Al mover las palancas a la posición de cerrado, tenga cuidado de no llevarlas a un punto en donde estén en contacto con el panel frontal. Si lo hace, podría dañar el módulo o el chasis.

Figure 3-7   Installing Module into Matrix N3, N1, or N5 Chassis (Matrix N3 shown)
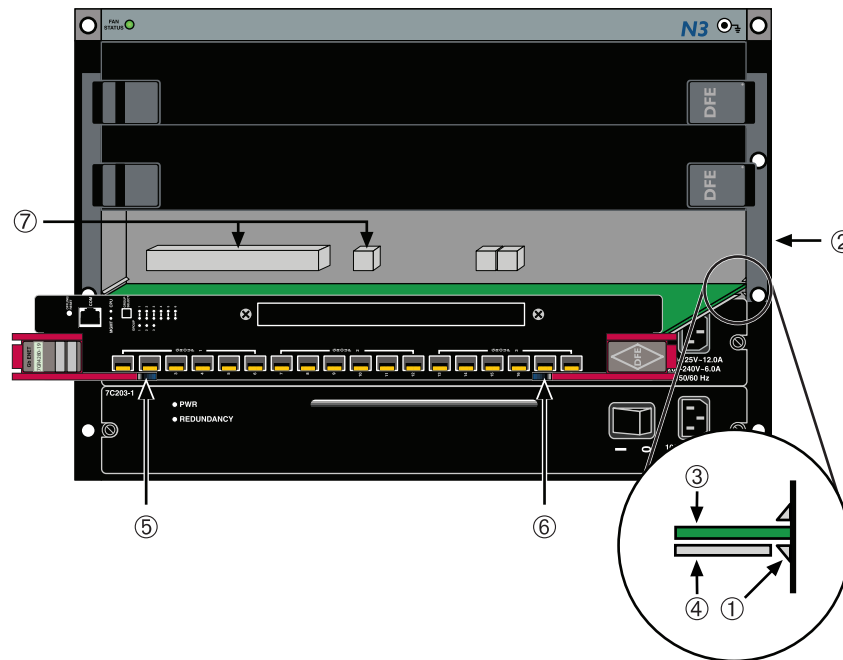
1	Card guides	**5**	Upper locking tab (shown in closed position)
2	Slot 1 (Top slot is slot 3.)	**6**	Lower locking tab (shown in closed position)
3	Module card	**7**	FTM2 backplane connectors
4	Metal back panel		

Connecting to the Network

This section provides the procedures for connecting unshielded twisted pair (UTP) segments from the network or other devices to the 7GR4202-30 ("Connecting UTP Cables to the 7GR4202-30" on page 3-14). For connections to Mini-GBIC ports on the 7GR4270-12 or the optional NEM, refer to "Connecting Fiber-Optic Cables to Mini-GBICs" on page 3-17.

📝 **Note:** If the DFE module is being installed in a network using Link Aggregation, there are rules concerning the network cable and port configurations that must be followed for Link Aggregation to operate properly. Before connecting the cables, refer to the *Enterasys Matrix DFE-Diamond/ Platinum Series Configuration Guide* for the configuration information. For details on how to obtain manuals, refer to the "Related Documents" in **About This Guide**.

Connecting UTP Cables to the 7GR4202-30

The fixed RJ45 front panel connections of the 7GR4202-30 front panel are 10/100/1000 Mbps ports. The ports have internal crossovers and also support automatic-polarity sensing when configured for automatic-negotiation.

If automatic-negotiation is not activated on a port, use a straight-through cable when connecting a workstation to the port. When connecting a networking device to the port, such as a bridge, repeater, or router, use a crossover cable.

If a port is set for auto-negotiation, automatic-polarity sensing is also activated. Automatic-polarity sensing eliminates the need for a crossover cable, regardless if the connection is to another network device or a workstation.

Note: All RJ45 front panel ports on the 7GR4202-30 support Category 5 Unshielded Twisted Pair (UTP) cabling with an impedance between 85 and 111 ohms. Category 3 cable may be used if the connection is going to be used only for 10 Mbps.

In this procedure, the 7GR4202-30 is used as the example to connect a twisted pair segment to the module. Refer to Figure 3-8 and proceed as follows:

1. Ensure that the device connected to the other end of the segment is powered ON.

2. Connect the twisted pair segment to the module by inserting the RJ45 connector on the twisted pair segment into the appropriate RJ45 port connector.

**Figure 3-8   Connecting a Twisted Pair Segment to the 7GR4202-30**
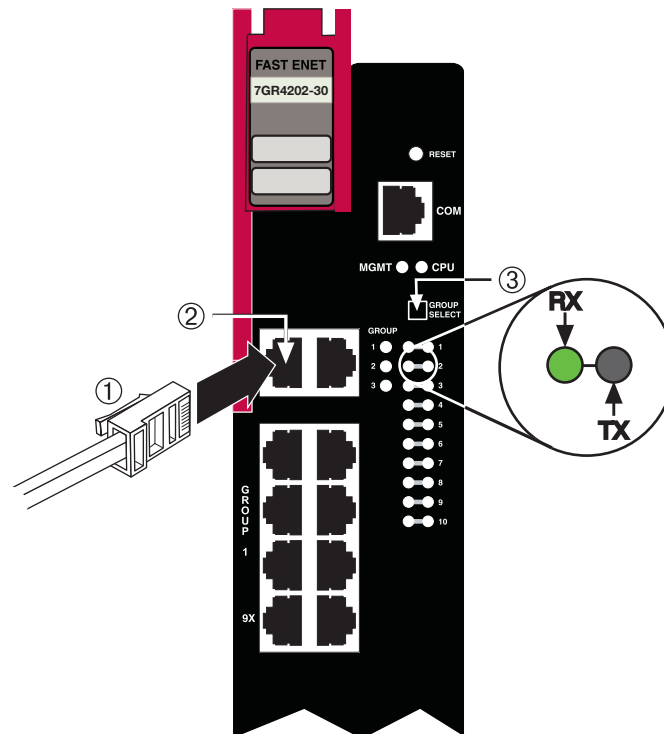
| **1** | RJ45 connector | **2** | RJ45 port connector | **3** | GROUP SELECT button |

3. Verify that a link exists by checking that the port RX (Receive) LED is ON (flashing amber, blinking green, or solid green). If the RX LED is OFF and the TX (Transmit) LED is not blinking amber, perform the following steps until it is on:

   a. To view the receive and transmit activity on a group of segments, press the GROUP SELECT button (see Figure 3-8) to step to the group of interest (Groups 1 through 4). Each time the GROUP SELECT button is pressed, the GROUP LED lights up in sequence, indicating which Group is selected. The receive and transmit activity for that group of segments is then indicated by the RX and TX LEDs for each segment.

   b. Verify that the cabling being used is Category 5 UTP with an impedance between 85 and 111 ohms. If the port is to operate at 100 Mbps, category 5 cabling must be used.

   c. Verify that the device at the other end of the twisted pair segment is on and properly connected to the segment.

   d. Verify that the RJ45 connectors on the twisted pair segment have the proper pinouts and check the cable for continuity. Typically, a crossover cable is used between hub devices. A straight-through cable is used to connect between switches or hub devices and an end user (computer). Refer to Figure 3-9 and Figure 3-10 for four-wire RJ45 connections. Refer to Figure 3-11 and Figure 3-12 for eight-wire RJ45 connections.

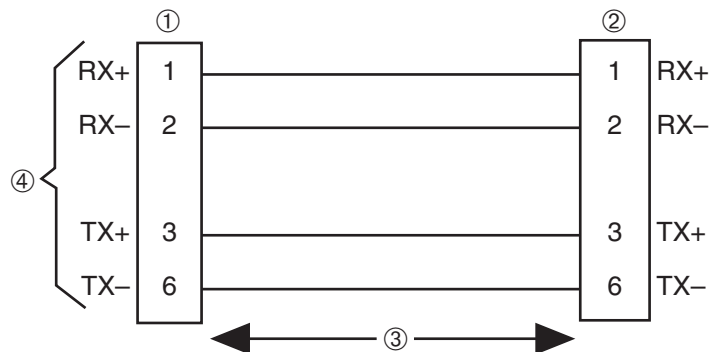**Figure 3-9   Crossover 4-Wire Cable RJ45 Pinouts, Connections Between Hub Devices**
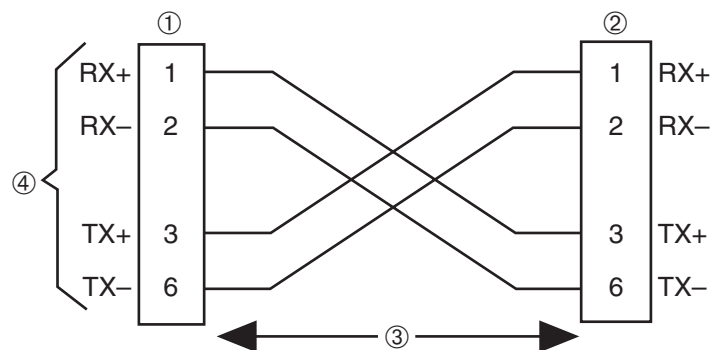
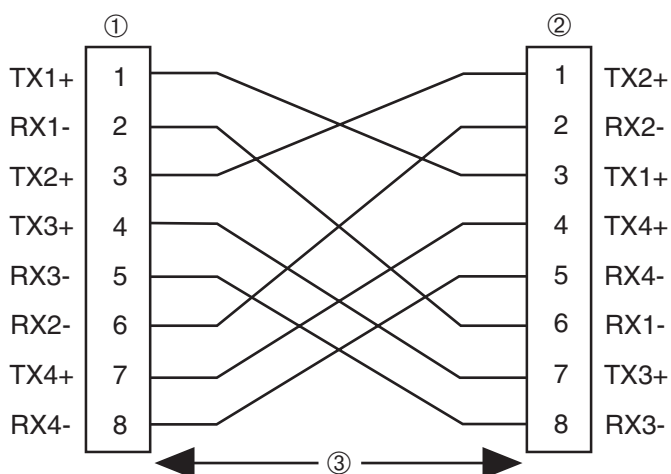| **1**	RJ45 device port	**3**	RJ45-to-RJ45 crossover cable
2	Other device port	**4**	RX+/RX- and TX+/TX- connections. These connections must share a common color pair.

Figure 3-10   Straight-Through 4-Wire Cable RJ45 Pinouts, Connections Between Switches and End User Devices

1	RJ45 device port	**3**	RJ45-to-RJ45 straight-through cable
2	Other device port	**4**	RX+/RX- and TX+/TX- connections. These connections must share a common color pair.

Figure 3-11   Eight-Wire Crossover Cable RJ45 Pinouts, Connections Between Hub Devices
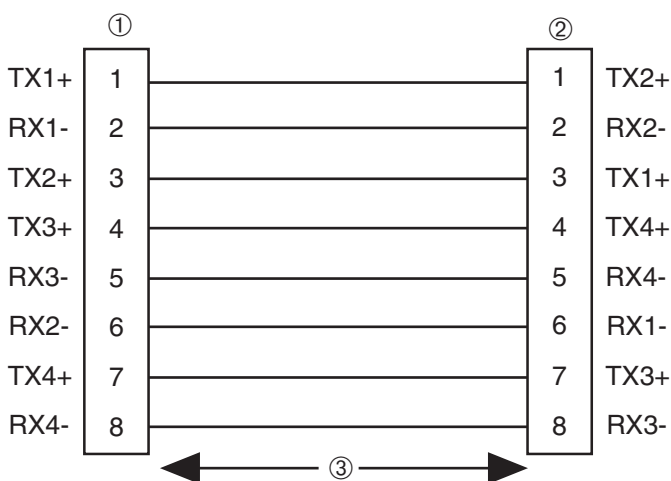

| **1** | RJ45 device port | **3** | RJ45-to-RJ45 crossover cable |
| **2** | Other device port | | |

Figure 3-12   Eight-Wire Straight-Through Cable RJ45 Pinouts, Connections Between Switches and End User Devices

| **1** | RJ45 device port | **3** | RJ45-to-RJ45 straight-through cable |
| **2** | Other device port | | |

e. Ensure that the twisted pair connection meets the dB loss and cable specifications outlined in the *Cabling Guide.* Refer to "Related Documents" in **About This Guide** for information on obtaining this document.

If a link is not established, contact Enterasys Networks. Refer to "Getting Help" on page xv for details.

4. Repeat steps 1 through 3 above, until all connections have been made.

Connecting Fiber-Optic Cables to Mini-GBICs

This section provides the procedure for connecting 1-Gigabit Ethernet fiber-optic segments from the network or other devices to Mini-GBIC MT-RJ or LC port connectors installed in the 7GR4270-12 or 7GR4280-19 DFE module or optional NEM.

Each fiber-optic link consists of two fiber-optic strands within the cable: Transmit (TX) and Receive (RX)

The transmit strand from a module port connects to the receive port of a fiber-optic Gigabit Ethernet device at the other end of the segment. The receive strand of the applicable MT-RJ port on the module connects to the transmit port of the fiber-optic Gigabit Ethernet device (shown in Figure 3-13) or LC cable connector (shown in Figure 3-14).

The following procedure describes how to connect an MT-RJ cable (Figure 3-13) connector to a Mini-GBIC port connector. This procedure also applies to an LC cable connector shown in (Figure 3-14). Refer to Figure 3-13 as an example and proceed as follows:

1. Remove the protective covers (not shown) from the MT-RJ fiber-optic port on the Mini-GBIC and from the connectors on each end of the cable.

> **Note:** Leave the protective covers in place when the connectors are not in use to prevent contamination.

> **Caution:** Do not touch the ends of the fiber-optic strands, and do not let the ends come in contact with dust, dirt, or other contaminants. Contamination of cable ends causes problems in data transmissions. If the ends of the fiber-optic strands become contaminated, use a canned duster to blow the surfaces clean. A cleaning swab saturated with optical-grade isopropyl alcohol may also be used to clean the ends.
>
> **Precaución:** No toque los extremos de los cables de fibra óptica y evite su contacto con el polvo, la suciedad o con cualquier otro contaminante. Si los extremos de los cables se ensucian, es posible que la transmisión de datos se vea afectada. Si nota que los extremos de los cables de fibra óptica se ensucian, utilice aire comprimido para limpiarlos. También puede limpiarlos con un estropajo embebido en alcohol isopropílico.

2. Insert the MT-RJ cable connector into the Mini-GBIC until it clicks into place.
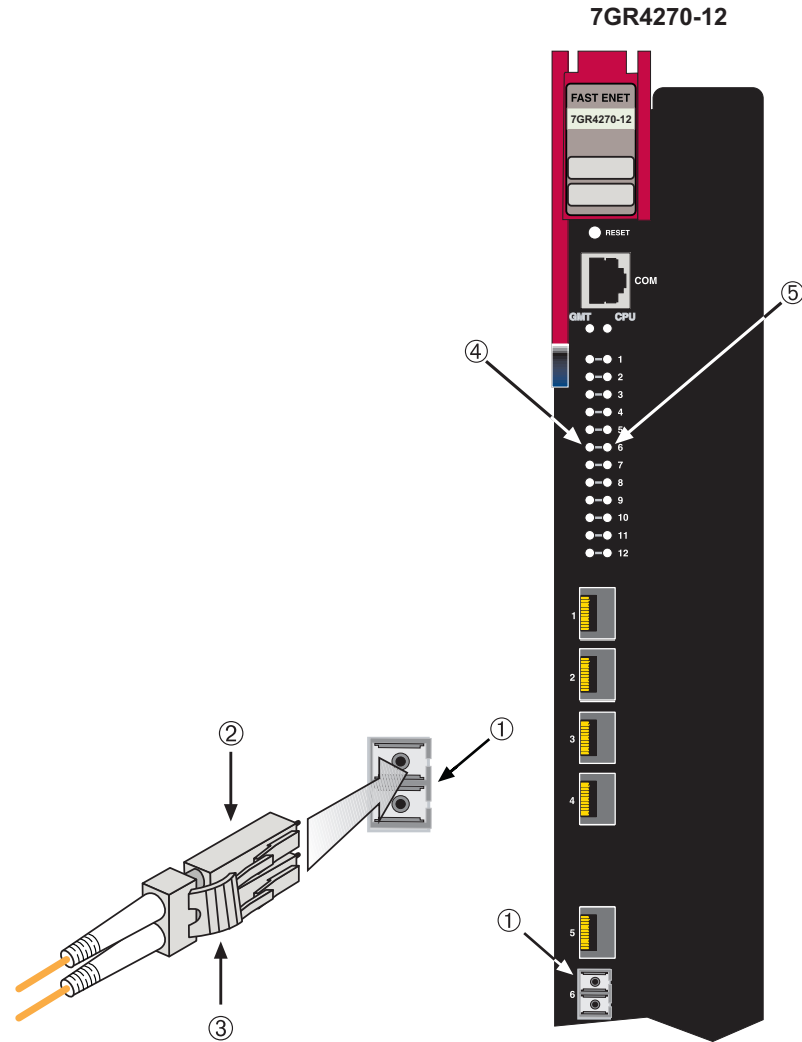
> **Note:** To remove the MT-RJ cable connector, press on its release tab and pull it out of the Mini-GBIC.

Figure 3-13   Cable Connection to MT-RJ Fiber-Optic Connectors
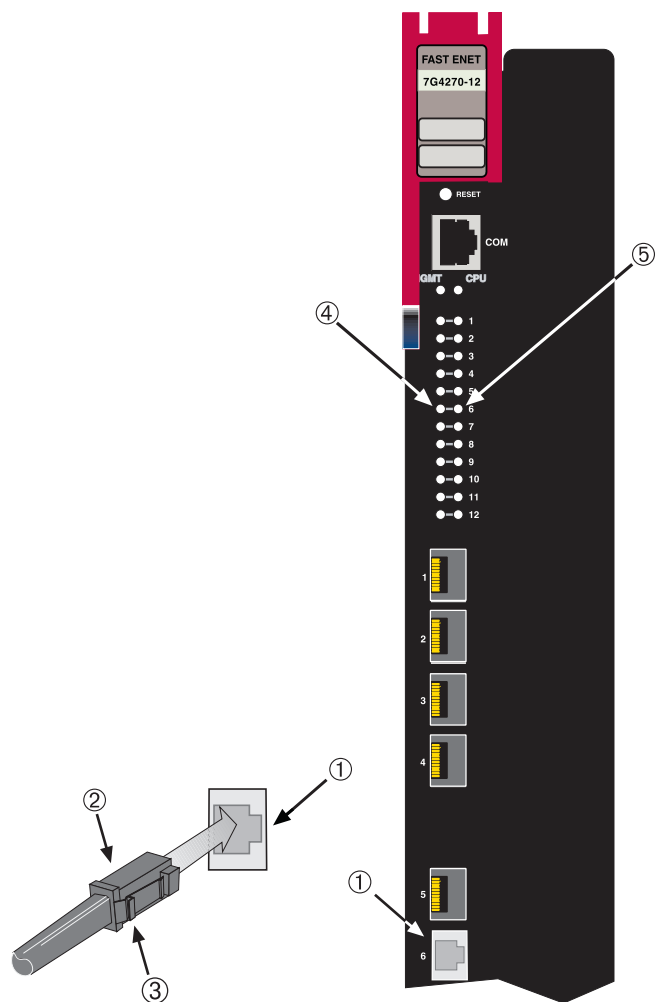
1	Installed Mini-GBIC MT-RJ connector	4	Receive LED (RX)
2	MT-RJ cable connector	5	Transmit LED (TX)
3	Release tab		

Figure 3-14   Cable Connection to LC Fiber-Optic Connectors

1	Installed Mini-GBIC LC connector	**4**	Receive LED (RX)
2	LC cable connector	**5**	Transmit LED (TX)
3	Release tab		

3. Verify that a link exists by checking that the port RX LED is on (flashing amber, blinking green, or solid green). If the RX LED is off, perform the following steps until it is on:

    a. Verify that the device at the other end of the segment is ON and connected to the segment.

    b. If there are separate fiber-optic connections on the other device, check the crossover of the cables. Swap the cable connections if necessary.

    c. Check that the fiber-optic connection meets the dB loss and cable specifications outlined in the *Cabling Guide* for multimode fiber-optic cabling. To obtain this document, refer to "Related Documents" in **About This Guide**.

    If a link has not been established, refer to Chapter 4 for LED troubleshooting details. If a problem persists, refer to "Getting Help" on page xv for details on contacting Enterasys Networks for support.

4. Repeat steps 1 through 3, above, until all connections have been made.

5. Plug the other end of the cable into the appropriate port on the other device. Some cables may be terminated at the other end with two separate connectors, one for each fiber-optic strand. In this case, ensure that the transmit fiber-optic strand is connected to the receive port and the receive fiber-optic strand to the transmit port.

Connecting to COM Port for Local Management

This section describes how to install a UTP straight-through cable with RJ45 connectors and optional adapters to connect a PC, a VT series terminal, or a modem to an Enterasys Networks module to access Local Management. This section also provides the pinout assignments of the adapters.

What Is Needed

The following is a list of the user-supplied parts that may be needed depending on the connection:

- RJ45-to-DB9 female adapter
- UTP straight-through cable terminated at both ends with RJ45 connectors
- RJ45-to-DB25 female adapter
- RJ45-to-DB25 male adapter

Using a UTP straight-through cable and an RJ45-to-DB9 adapter, you can connect products equipped with an RJ45 COM port to an IBM or compatible PC running a VT series emulation software package.

Using a UTP straight-through cable and an RJ45-to-DB25 female adapter, you can connect products equipped with an RJ45 COM port to a VT series terminal or VT type terminals running emulation programs for the VT series.

Using a UTP straight-through cable and an RJ45-to-DB25 male adapter, you can connect products equipped with an RJ45 COM port to a Hayes compatible modem that supports 9600 baud.

## Connecting to an IBM PC or Compatible Device

To connect an IBM PC or compatible device, running the VT terminal emulation, to an Enterasys Networks module COM port (Figure 3-15), proceed as follows:

1. Connect the RJ45 connector at one end of the UTP straight-through cable to the communications COM port on the Enterasys Networks module. (The COM port is also known as a Console port.)

2. Plug the RJ45 connector at the other end of the UTP straight-through cable into an RJ45-to-DB9 adapter.

3. Connect the RJ45-to-DB9 adapter to the communications port on the IBM PC.

4. Turn on the PC and set the following parameters on your VT emulation package:

Parameter	Setting
Mode	7 Bit Control
Transmit	Transmit=9600
Bits Parity	8 Bits, No Parity
Stop Bit	1 Stop Bit

5. When these parameters are set, the Local Management password screen will display. Refer to the appropriate *Enterasys Matrix DFE-Diamond/Platinum Series Configuration Guide* for further information.

Figure 3-15   Connecting an IBM PC or Compatible

1	UTP straight-through cable with RJ45 connectors	**3**	RJ45-to-DB9 PC adapter
2	RJ45 COM port	**4**	IBM PC or compatible device
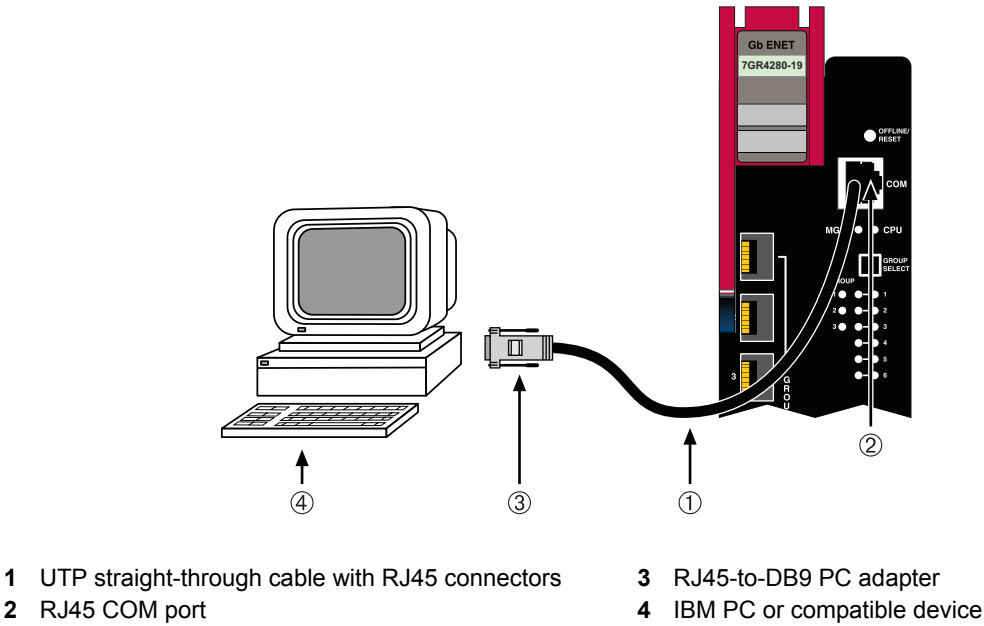
Connecting to a VT Series Terminal

To connect a VT Series terminal to an Enterasys Networks DFE module COM port (Figure 3-16), use a UTP straight-through cable with RJ45 connectors and an RJ45-to-DB25 female adapter, and proceed as follows:

1. Connect the RJ45 connector at one end of the UTP straight-through cable to the COM port on the Enterasys Networks module.

2. Plug the RJ45 connector at the other end of the UTP straight-through cable into the RJ45-to-DB25 female adapter.

3. Connect the RJ45-to-DB25 adapter to the port labeled COMM on the VT terminal.

4. Turn on the terminal to access the Setup Directory and set the following parameters:

Parameter	Setting
Mode	7 Bit Control
Transmit	Transmit=9600
Bits Parity	8 Bits, No Parity
Stop Bit	1 Stop Bit

When these parameters are set, the Local Management password screen will display. Refer to the *Enterasys Matrix DFE-Diamond/Platinum Series Configuration Guide* for further information.

Figure 3-16   Connecting a VT Series Terminal

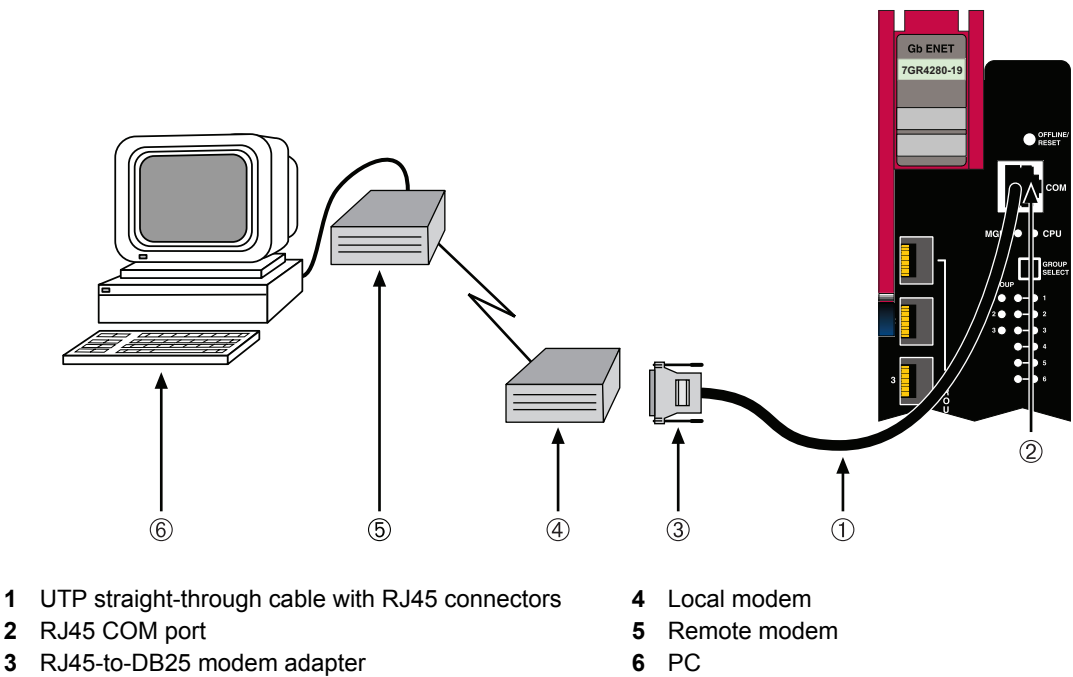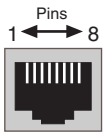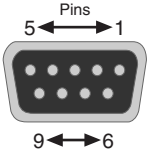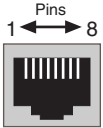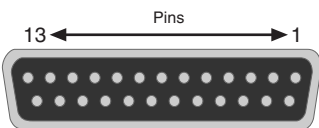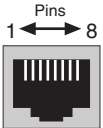|			
1	UTP straight-through cable with RJ45 connectors	**3**	RJ45-to-DB25 VT adapter
2	RJ45 COM port	**4**	VT series terminal
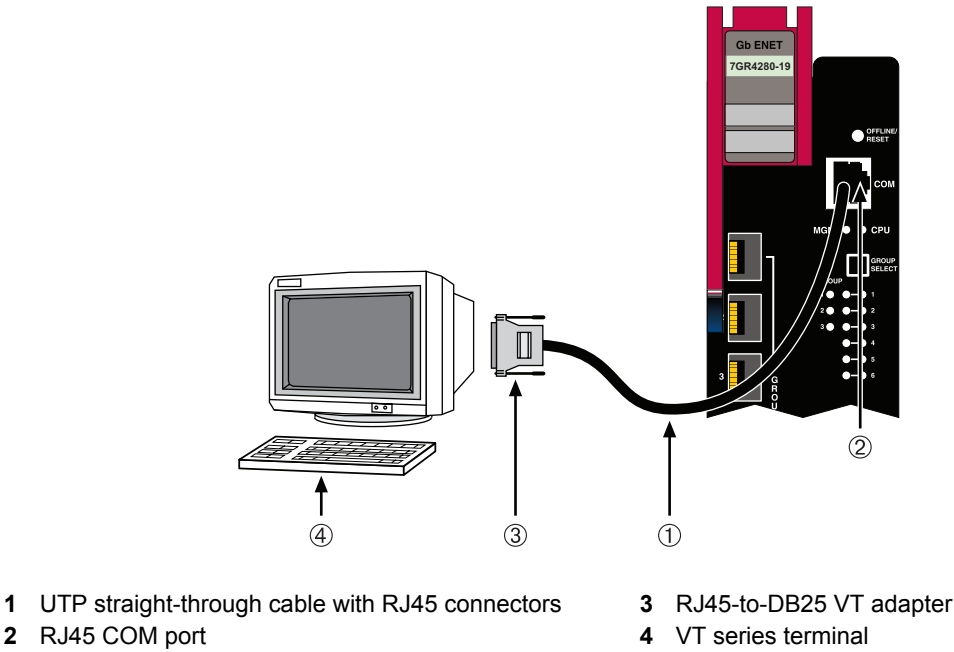
Connecting to a Modem

To connect a modem to an Enterasys Networks DFE module COM port (Figure 3-17), use a UTP straight-through cable with RJ45 connectors and an RJ45-to-DB25 male adapter, and proceed as follows:

1. Connect the RJ45 connector at one end of the UTP straight-through cable to the COM port of the module.

2. Plug the RJ45 connector at the other end of the UTP straight-through cable into the RJ45-to-DB25 modem adapter.

3. Connect the RJ45-to-DB25 adapter to the communications port on the modem.

4. Turn on the modem.

5. With a PC connected to a remote modem, you can configure the switch remotely. To accomplish this, you must configure your PC VT emulation package with the following parameters:

Parameter	Setting
Mode	7 Bit Control
Transmit	Transmit=9600
Bits Parity	8 Bits, No Parity
Stop Bit	1 Stop Bit

6. When these parameters are set, the Local Management password screen will display. Refer to the *Enterasys Matrix DFE-Diamond/Platinum Series Configuration Guide* for further information.
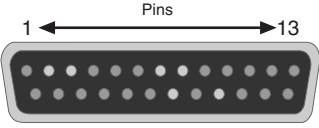
Figure 3-17   Connecting to a Modem

1	UTP straight-through cable with RJ45 connectors	**4**	Local modem
2	RJ45 COM port	**5**	Remote modem
3	RJ45-to-DB25 modem adapter	**6**	PC

Adapter Wiring and Signal Assignments

COM Port Adapter Wiring and Signal Diagram			
RJ45		**DB9**	
Pin	Conductor	Pin	Signal
1	Blue	2	Receive (RX)
4	Red	3	Transmit (TX)
5	Green	5	Ground (GRD)
2	Orange	7	Request to Send (RTS)
6	Yellow	8	Clear to Send (CTS)

RJ45 Connector (Female)

DB9 Connector (Female)

VT Series Port Adapter Wiring and Signal Diagram			
RJ45		**DB25**	
Pin	Conductor	Pin	Signal
4	Red	2	Transmit (TX)
1	Blue	3	Receive (RX)
6	Yellow	5	Clear to Send (CTS)
5	Green	7	Ground (GRD)
2	Orange	20	Data Terminal Ready

Pins
1 ◄──► 8

RJ45 Connector (Female)

Pins
13 ◄───────► 1
25 ◄───────► 14

DB25 Connector (Female)

Modem Port Adapter Wiring and Signal Diagram			
RJ45		DB25	
Pin	Conductor	Pin	Signal
1	Blue	2	Transmit (TX)
2	Orange	8	Data Carrier Detect (DCD)
4	Red	3	Receive
5	Green	7	Ground (GRD)
6	Yellow	20	Data Terminal Ready (DTR)
8	Gray	22	Ring Indicator

Pins
1 ◄──► 8

RJ45 Connector (Female)

Pins
1 ◄───────► 13
14 ◄───────► 25

DB25 Connector (Male)

Completing the Installation

Completing the DFE module installation depends on if the module is being installed in:

- a new DFE module system (refer to "Completing the Installation of a New System" on page 3-25), or

- an established, operating DFE module system (refer to "Completing the Installation of a DFE Module in an Existing System" on page 3-26).

Completing the Installation of a New System

In a new system of DFE modules, one of the installed DFE modules will become the management module on chassis power up, and all DFE modules will automatically be set to the factory default values. A complete list of the factory default values are provided in Chapter 3 of the *Enterasys Matrix DFE-Diamond/Platinum Series Configuration Guide*.

After installing all DFE modules into the host chassis and making the connections to the network, proceed to the following First-Time Log-In Using a Console Port Connection procedure to access the module management startup screen from your PC, terminal, or modem connection.

First-Time Log-In Using a Console Port Connection

> **Note:** This procedure applies only to initial log-in, and to logging in to a device not yet configured with administratively-supplied user and password settings.
>
> By default, the Matrix DFE Series device is configured with three user login accounts: **ro** for Read-Only access; **rw** for Read-Write access; and **admin** for super-user access to all modifiable parameters. The default password is set to blank (carriage return). For information on changing these default passwords, refer to Chapter 3 in the *Enterasys Matrix DFE-Diamond/Platinum Series Configuration Guide*.

Start the Command Line Interface (CLI) from the module's local console port as follows:

1. Connect a terminal to the local console port as described in "Connecting to COM Port for Local Management" on page 3-20. The startup screen, Figure 3-18, displays.

2. At the login prompt, enter one of the following default user names:

   – **ro** for Read-Only access,

   – **rw** for Read-Write access, or

   – **admin** for Super User access. (This access level allows Read-Write access to all modifiable parameters, including user accounts.)

3. Press ENTER.

4. The Password prompt displays. Leave this string blank and press ENTER. The module information and Matrix prompt displays as shown in Figure 3-18.

The DFE module is now ready to be configured. For information about setting the IP address and configuring Telnet settings for remote access to DFE management, refer to Chapter 3 in the *Enterasys Matrix DFE-Diamond/Platinum Series Configuration Guide*. The CLI commands enable you to initially set up and perform more involved management configurations.

The *Enterasys Matrix DFE-Diamond/Platinum Series Configuration Guide* is available online at:

http://www.enterasys.com/support/manuals

If you require assistance, contact Enterasys Networks using one of the methods described in "Getting Help" on page xv.

Figure 3-18   Matrix DFE Startup Screen Example (N7 Chassis)

```
login: admin
Password:


M A T R I X N7
Command Line Interface

Enterasys Networks, Inc.
50 Minuteman Rd.
Andover, MA 01810-1008 U.S.A.

Phone:  +1 978 684 1000
E-mail: support@enterasys.com
WWW:   http://www.enterasys.com

(c) Copyright Enterasys Networks, Inc. 2003

Chassis Serial Number:     xxxxxxxxxxxx
Chassis Firmware Revision: xx.xx.xx

Matrix N7(su)->
```

Completing the Installation of a DFE Module in an Existing System

In an established DFE module system,

- a DFE module is already established as the management module,

- the passwords have already been set for various users,

- the system IP address is set, and

- other system parameters have been set.

When you install a new DFE module into a system with an existing configured user account, the current system settings in that account are already recognized by the new DFE module and it will operate accordingly.

If you need to change any settings, you can connect a terminal to the local console port as described in "Connecting to COM Port for Local Management" on page 3-20 to access system management, or use a Telnet connection to access the DFE module system management as described in the *Enterasys Matrix DFE-Diamond/Platinum Series Configuration Guide*.

Logging in with an Administratively-Configured User Account

If the device's default user account settings have been changed, proceed as follows:

1. At the login prompt, enter your administratively-assigned user name and press ENTER.

2. At the Password prompt, enter your password and press ENTER.

The notice of authorization and the Matrix prompt displays as shown in Figure 3-18 on page 3-26.

> **Note:** Users with Read-Write (rw) and Read-Only (ro) access can use the **set password** command to change their own passwords. Administrators with Super User (su) access can use the **set system login** command to create and change user accounts, and the **set password** command to change any local account password. For information on the set password and set system login commands, refer to the *Enterasys Matrix DFE-Diamond/Platinum Series Configuration Guide*.

The DFE module is now ready to be configured. For information about setting the IP address and configuring Telnet settings for remote access to DFE management, refer to the *Enterasys Matrix DFE-Diamond/Platinum Series Configuration Guide*. The CLI commands enable you to initially set up and perform more involved management configurations.

The *Enterasys Matrix DFE-Diamond/Platinum Series Configuration Guide* is available online at:

http://www.enterasys.com/support/manuals

If you require assistance, contact Enterasys Networks using one of the methods described in "Getting Help" on page xv.

4

Troubleshooting

This chapter provides information concerning the following:

Using LANVIEW

The modules use a built-in visual diagnostic and status monitoring system called LANVIEW. The LANVIEW LEDs (Figure 4-1) allow quick observation of the network status to aid in diagnosing network problems.

About the Management (MGMT) LED

The MGMT LED (shown in Figure 4-1) indicates when the module is serving as the Management Module to control the management functions for all DFE modules in the chassis. The Management Module handles all IP requests to the chassis IP address, such as PING, Telnet, SNMP, or HTTP. The Management Module also handles the CLI configuration sessions via the console port. So, when you plug into a DFE module COM port to configure a DFE module in the chassis, it is handled by the Management Module regardless of the DFE module COM port that you use.

Viewing the Receive and Transmit Activity

On the 7GR4270-12 , 7GR4202-30, and 7GR4280-19 DFE modules, you can view the receive and transmit activity on the RX and TX LEDs. However, only one group of six ports may be viewed at a time on the 7GR4280-19.

To view the receive and transmit activity on a group of 7GR4280-19 segments, press the GROUP SELECT button (see Figure 4-1) for less than one second to step to the group of interest (Groups 1 through 3). Each time the GROUP SELECT button is pressed for less than one second, the GROUP LED lights up in sequence, indicating which group is selected. The receive and transmit activity for that group of segments is then indicated by the RX and TX LEDs for each port.

Figure 4-1   LANVIEW LEDs

| **1** | MGMT LED | **2** | Group 1, Port 1 LEDs |
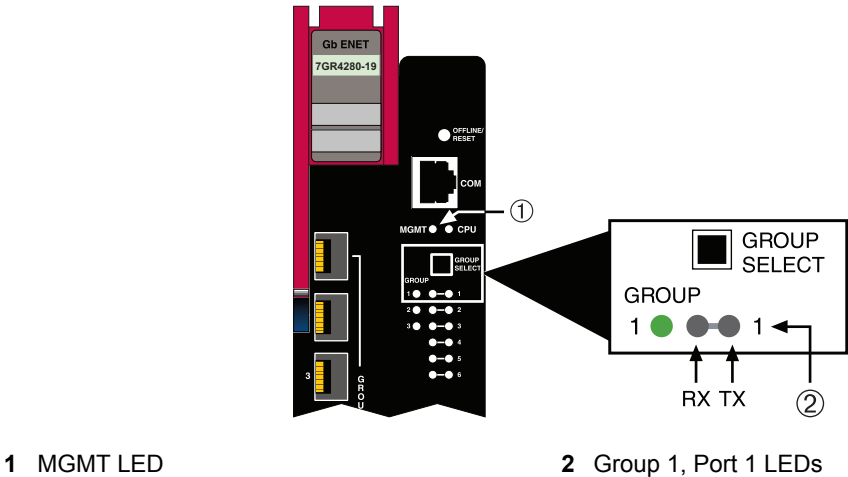
Table 4-1 describes the LED indications and provides recommended actions as appropriate.

> **Note:** The terms **flashing**, **blinking**, and **solid** used in Table 4-1 indicate the following:
>
> **Flashing** indicates an LED is flashing randomly.
>
> **Blinking** indicates an LED is flashing at a steady rate (approximately 50% on, 50% off).
>
> **Solid** indicates a steady LED light. No pulsing.
>
> **Alternate** indicates an LED is flashing in a steady rate other than 50% on, 50% off.

Table 4-1   LANVIEW LEDs

LED	Color	State	Recommended Action
MGMT	None	**Off**. This module is NOT the Management Module.	None.
	Green	**Solid**. This module is the designated Management Module.	None.
	Amber	**Flashing**. This is a temporary indication that the module is saving data.	None.

Table 4-1   LANVIEW LEDs (continued)

LED	Color	State	Recommended Action
CPU	None	Power off.	Ensure chassis has adequate power.
	Amber	**Blinking**. Module in process of booting.	None.
		Solid. Testing.	If the LED remains amber for several minutes, contact Enterasys Networks for technical support.
	Green	**Blinking**. Image starts running.	None.
		Solid. Functional.	None.
	Red	**Solid**. Processor in reset.	None.
	Green and Amber	**Blinking**. Indicates that the DFE module is in the process of shutting down.	None. This state is activated when the RESET button is pressed for less than 1 second to a start the process of an orderly shutdown. While in this state, do not remove any DFE module.
	Amber and off	**Alternate (67% on, 33% off)**. Indicates that a shutdown process has completed. This indication will remain for 60 seconds before automatically restarting.	While in this state, you have 60 seconds to safely remove the DFE module from the chassis.
RX (Receive)	None	**No link**. No activity. Port enabled or disabled.	None.
	Green	**Solid**. Link present, port enabled, no traffic is being received by the interface.	None.
	Amber	**Flashing**. Link present, port enabled, traffic is being received by the interface.	None.
RX	Red	**Blinking**. Indicates collisions. This indication is only supported on 10/100 ports.	Contact Enterasys Networks for technical support.
TX (Transmit)	None	Port enabled, but no activity.	If it is known that the port should be active and is not, contact Enterasys Networks for technical support.
	Green	**Flashing**. Indicates data transmission activity. Rate of flashing indicates the data rate.	None.
	Red	**Flashing**. Fault or Error (collision).	None, unless there is a high rate of activity. In this case, check for network configuration problems or a defective device.

Troubleshooting Checklist

If the module is not working properly, refer to Table 4-2 for a checklist of problems, possible causes, and recommended actions to resolve the problem.

Table 4-2   Troubleshooting Checklist

Problem	Possible Cause	Recommended Action
All LEDs are OFF.	Loss of power.	Ensure that the module was installed properly according to the installation instructions in Chapter 3, and that the host chassis is providing power.
No Local Management Password screen.	Incorrect terminal setup.	Refer to the *Enterasys Matrix DFE-Diamond/ Platinum Series Configuration Guide* for proper setup procedures.
	Improper console cable pinouts.	Refer to Appendix A for proper COM port pinouts.
	Corrupt firmware image, or hardware fault.	If possible, attempt to download the image to the module again. Refer to "Setting the Mode Switches" on page B-1 for instructions to clear NVRAM.
Cannot navigate beyond Password screen.	Improper username/ password combination entered.	If the username/password combination has been forgotten, refer to "Setting the Mode Switches" on page B-1 for instructions on how to set the mode switch to reset the username/password combination to the default values.
Cannot contact the module through in-band management.	IP address not assigned.	Refer to the *Enterasys Matrix DFE-Diamond/ Platinum Series Configuration Guide* for the IP address assignment procedure.
	Port is disabled.	Enable port. Refer to the *Enterasys Matrix DFE-Diamond/Platinum Series Configuration Guide* for instructions to enable/disable ports.
	Host Port policy and/or management VLAN is incorrectly configured, or not configured.	Verify that a management VLAN exists and that it is associated with the Host Port. Refer to the *Enterasys Matrix DFE-Diamond/ Platinum Series Configuration Guide* for information about Host Port and management VLAN configuration.
	No link to device.	Verify that all network connections between the network management station and the module are valid and operating. If the problem continues, contact Enterasys Networks for technical support.
Port(s) goes into standby for no apparent reason.	Loop condition detected.	Verify that Spanning Tree is enabled. Refer to the *Enterasys Matrix DFE-Diamond/Platinum Series Configuration Guide* for the instructions to set the type of STA. Review the network design and delete unnecessary loops. If the problem continues, contact Enterasys Networks for technical support.

Table 4-2   Troubleshooting Checklist (continued)

Problem	Possible Cause	Recommended Action
User parameters (IP address, device and module name, etc.) were lost when the module power was cycled, the front panel RESET button was pressed.	Position of Mode switch (7), Persistent Data Reset, was changed sometime before either cycling power or pressing the RESET button, causing the user-entered parameters to reset to factory default settings. Clear Persistent Data that was set through Local Management. The module was moved either from slot-to-slot or from chassis-to-chassis.	Reenter the lost parameters as necessary. Refer to the *Enterasys Matrix DFE-Diamond/Platinum Series Configuration Guide* for the instructions to configure the device. If the problem continues, contact Enterasys Networks for technical support.

Overview of DFE Module Shutdown Procedure

> ⚠ **Caution:** Do not remove a DFE-Diamond module from an operating chassis system before reading the following information and instructions.
>
> **Precaución:** Antes de retirar los módulos DFE-Diamond del chasis en funcionamiento, lea las siguientes instrucciones y la información suministrada.

The DFE modules installed in a Matrix E7,Matrix N1, Matrix N3, Matrix N5, or Matrix N7 chassis are interdependent and operate under a single IP address as a single, distributed switch system (hardware, databases, and persistent storage). In this operating environment, the DFE module must shut down in an orderly fashion to ensure that the other modules in the system and other devices on the network are notified of the impending change. The device(s) can then make intelligent decisions and stabilize the network before the change is made; thereby increasing network availability.

You can shut down a DFE module in an operating system using the OFFLINE/RESET switch shown in Figure 4-2. There are two procedures to shut down a DFE module.

- Recommended shutdown procedure ("Recommended Shutdown Procedure" on page 4-6)

- Last resort shutdown procedure (not recommended) ("Last Resort Shutdown Procedure" on page 4-7)

Figure 4-2   OFFLINE/RESET Switch
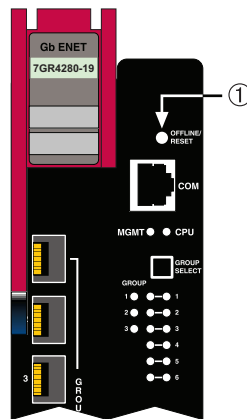
1   OFFLINE/RESET switch

Recommended Shutdown Procedure

Caution: Do not pull any DFE-Diamond module out of an operating chassis before it has completed its shutdown routine.

Precaución: No retire los módulos DFE-Diamond del chasis en funcionamiento hasta que no se haya terminado con la rutina de apagado.

Before pulling a DFE module out of a chassis,

press or tap on its OFFLINE/RESET switch for less than 1 second.

Its CPU LED changes from solid green to blinking between green and amber, indicating that the DFE module is shutting down. At the end of the DFE module shutdown routine, the CPU LED changes to a 67%/33% sequence of amber/off, respectively, indicating the module is in a halt state. In this time it is safe to restart or remove the DFE module from the chassis.

When a controlled shutdown is initiated from the OFFLINE/RESET switch, you have 60 seconds from the time the CPU starts flashing amber/off until the time the device is automatically restarted.

Note: The only safe time to pull a DFE module out of the chassis is when the CPU LED is blinking amber. Otherwise, system operation will be interrupted.

Last Resort Shutdown Procedure

⚠ **Caution:** This method of shutting down a DFE-Diamond module is not recommended except as a last resort, because all processes currently running on the module will be interrupted resulting in loss of frames.

Precaución: No se recomienda utilizar este método para apagar los módulos DFE-Diamond. Recurra a él sólo como último recurso, puesto que interrumpe todos los procesos del módulo en funcionamiento, lo que podría resultar pérdidas de frames.

To reset a DFE module without it performing an orderly shutdown routine,

press and hold the OFFLINE/RESET switch for approximately 6 seconds.

Pulling any DFE module out of the chassis before it has been shut down is not recommended. The only safe time to pull a module out of the chassis is after the completion of a shutdown and the management LED is flashing amber/off.

A

Specifications

This appendix provides information about the following:

Enterasys Networks reserves the right to change the specifications at any time without notice.

DFE Module Specifications

Table A-1 provides the I/O ports, processors and memory, physical, and environmental module specifications for the 7GR4270-12, 7GR4202-30, 7GR4280-19, and 7KR4290-02 DFE modules. Unless noted differently, the specifications apply to all four DFE modules.

Table A-1   Specifications

Item	Specification
7GR4270-12 Ports	
Ports 1 through 12	Twelve fixed Mini-GBIC slots for up to twelve mix-and-match 1000BASE-SX and -LX compliant Mini-GBICs. Refer to "Mini-GBIC Input/Output Specifications" on page A-3 for a list of the supported Mini-GBICs.
7GR4202-30 Ports	
Ports 1 through 30	Thirty, 10BASE-T/100BASE-TX/1000BASE-T compliant ports via RJ45 connectors.
7GR4280-19 Ports	
Ports 1 through 18	Mini-GBIC slots for up to 18 mix-and-match 1000BASE-SX, -LX, -ELX and 1000BASE-T compliant Mini-GBICs. Refer to "Mini-GBIC Input/Output Specifications" on page A-3.
Option Slot	Supports one optional network expansion module.

Table A-1   Specifications (continued)

Item	Specification
7KR4290-02 Ports	
Ports 1 and 2	Port interface option slots that support 10GBASE XENPAK PHYs. Each port can support a full 10 Gbps throughput with a maximum of 20 Gbps, when both ports are active at the same time.
Processors/Memory	
Processor	IBM 750CXe, 600 MHz processor
Dynamic Random Access Memory (DRAM)	256 MB
FLASH Memory	32 MB
Physical	
Dimensions	46.43 H x 6.05 W x 29.51 D (cm)
	18.28 H x 2.38 W x 11.62 D (in.)
Approximate Weight	

7GR4270-12
   7GR4202-30
   7KR4290-02
	Gross: 5.54 kg (12.0 lb) (shipping carton containing one module)
	Net: 4.10 kg (9.0 lb) (one module without packaging)

Approximate Weight	
7GR4280-19	Gross: 5.0 kg (11.0 lb) (shipping carton containing one module) Net: 3.86 kg (8.5 lb) (one module without packaging)
Predicted hours for Mean Time Between Failures (MTBF) for DFE modules:	Refer to the MTBF web site at this URL: http://www.enterasys.com/support/mtbf/
Environmental	
Operating Temperature	5°C to 40°C (41°F to 104°F)
Storage Temperature	-30°C to 73°C (-22°F to 164°F)
Operating Relative Humidity	5% to 90% (non-condensing)

Mini-GBIC Input/Output Specifications

The Mini-Gigabit Ethernet Card (Mini-GBIC) port interface slots can accept 1000BASE-SX short wavelength or 1000BASE-LX long wavelength fiber-optic Mini-GBICs (see Table A-2). The optional Mini-GBICs are hot swappable.

Table A-2   Mini-GBIC Input/Output Port Specifications

Item	Specification
MGBIC-LC01	Provides one LC fiber-optic multimode port that is compliant with the 1000BASE-SX standard LC connector.
MGBIC-LC03	Provides one LC fiber-optic multimode port that is compliant with the 1000BASE-SX standard LC duplex style connector.
MGBIC-LC09	Provides one LC fiber-optic single-mode port that is compliant with the 1000BASE-LX standard LC connector.
MGBIC-MT01	Provides one MT-RJ fiber-optic multimode port that is compliant with the 1000BASE-SX standard MT-RJ connector.
MGBIC-08	Provides one LC fiber-optic single-mode port that is compliant with the 1000BASE-ELX standard LC connector.
MGBIC-02	Provides one RJ45 copper connection that is compliant with the 1000BASE-T standard RJ45 connector.

Gigabit Ethernet Specifications

The following specifications for the Mini-GBICs (shown in Table A-3 through Table A-11) meet or exceed the IEEE 802.3z-1998 standard.

MGBIC-LC01/MGBIC-MT01 Specifications (1000BASE-SX)

Table A-3   MGBIC-LC01 / MGBIC-MT01 Optical Specifications

Item	62.5 µm MMF	50 µm MMF
Transmit Power (minimum)	-9.5 dBm	-9.5 dBm
Receive Sensitivity	-17 dBm	-17 dBm
Link Power Budget	7.5 dBm	7.5 dBm

Table A-4   MGBIC-LC01 / MGBIC-MT01 Operating Range

Item	Modal Bandwidth @ 850 nm	Range
62.5 µm MMF	160 MHz/km	2-220 Meters
62.5 µm MMF	200 MHz/km	2-275 Meters
50 µm MMF	400 MHz/km	2-500 Meters
50 µm MMF	500 MHz/km	2-550 Meters

MGBIC-LC03 Specifications (1000BASE-SX)

Table A-5   MGBIC-LC03 Optical Specifications

Item	62.5/125 µm MMF	50/125 µm MMF
Transmit Power (minimum)	-9.5 dBm	-9.5 dBm
Transmit Power (maximum)	-3 dBm	-3 dBm
Receive Sensitivity	-20 dBm	-20 dBm
Link Power Budget[1] (Multimode Only)	10.5 dBm	10.5 dBm

1. The maximum drive distance (up to 2 km) depends on the quality of the installed multimode fiber-optic cable segment. Use the Link Power Budget to calculate the maximum cable length of the attached segment. The Link Power Budget must not exceed those specified in this table. The MGBIC-LC03 input power must not exceed -3 dBm. Otherwise, saturation could occur.

Table A-6   MGBIC-LC03 Operating Range

Item	Modal Bandwidth @ 1310 nm	Range
62.5 µm MMF	160 MHz/km	2,000 Meters
50 µm MMF	400 MHz/km	2,000 Meters

MGBIC-LC09 Specifications (1000BASE-LX)

Table A-7   MGBIC-LC09 Optical Specifications

Item	62.5 µm MMF	50 µm MMF	10 µm MMF
Transmit Power (minimum)	-11.5 dBm	-11.5 dBm	-9.5 dBm
Receive Sensitivity	-20 dBm	-20 dBm	-20 dBm
Link Power Budget	8.5 dBm	8.5 dBm	10.5 dBm

Table A-8   MGBIC-LC09 Operating Range

Item	Modal Bandwidth @ 1300 nm	Range
62.5 µm MMF	500 MHz/km	2-550 Meters
50 µm MMF	400 MHz/km	2-550 Meters
50 µm MMF	500 MHz/km	2-550 Meters
10 µm SMF	N/A	2-10,000 Meters

MGBIC-08 Specifications (1000BASE-ELX)

Table A-9   MGBIC-08 Optical Specifications

Item			
Transmit Power (minimum)	-0 dBm, min.	+2 dBm, typical	+5 dBm, max.
Receive Sensitivity	-24 dBm, min.	-26 dBm, typical	
Maximum Input Power	-3 dBm		
Link Power Budget[1] (Full Duplex Only)	23 dB	28dB, typical	

1. The maximum drive distance (up to 70 km) depends on the quality of the installed single-mode fiber-optic cable segment. Use the Link Power Budget to calculate the maximum cable length of the attached segment. The Link Power Budget must not exceed those specified in this table. The MGBIC-08 input power must not exceed -3 dBm. Otherwise, saturation could occur.

Table A-10   MGBIC-08 Operating Range

Item	1550 nm	Range
9 or 10 µm SMF	N/A	70,000 Meters

MGBIC-02 Specifications (1000BASE-T)

Table A-11   MGBIC-02 / Specifications

Item	Specification
Supported Cable Type: Maximum Length	Copper, Category 5 UTP Up to 100 meters
Connector	RJ45
Data Rate	1 Gbps, IEEE 802.3:2000 compatible 1000BASE-T operation only Automatic crossover detection
TX Output impedance	100 ohms, typical at all frequencies between 1 MHz and 125 MHz
RX Input impedance	100 ohms, typical at all frequencies between 1 MHz and 125 Hz

10GBASE XENPAK PHY Specifications

At the time of printing of this manual, there are four 10GBASE XENPAK modules available. Tables A-12 through A-14 provide the specifications for each XENPAK module.

Table A-12   XENPAK Port, Physical, and Environmental Specifications

Item	Specification
Port	
One Port	Port interface that can support a full 10 Gbps throughput.
Physical	
Dimensions	11.33 H x 3.48 W x 1.17 D (cm) 4.46 H x 1.37 W x 0.46 D (in.)
Approximate Weight	Net: 0.13 kg (0.29 lbs)
Environmental	
Operating Temperature	5° to 40° C (41° to 104° F) -30° to 73° C (-22° to 164° F)
Storage Temperature	-30° to 73° C (-22° to 164° F)
Operating Relative Humidity	5% to 90% (non-condensing)

Table A-13 provides you with the input/output specifications for each version of XENPAK.

Table A-13   XENPAK Fiber-Optic Specifications

XENPAK PHY	Output Power	Extinction Ratio	Received Sensitivity	Link Budget
10GBASE-LR	<0.5 dBm	>4 dB	-10.28 dBm	0 to 9.4 dB
10GBASE-ER	<4.0 dBm	>3 dB	-10.3 dBm	5 to 11 dB
10GBASE-LX4	<0.5 dBm	>3.5 dB	-10.3 dBm	0 to 7.5 dB
			-13.4 dBm (on 10μm fiber)	0 to 8.2 dB (on 10μm fiber)
10GBASE-SR	<-1 dBm	>3 dB	-11.1 dBm	7.3 dB

Table A-14 provides you with the necessary information to make decisions concerning the cable type, maximum length, and connector type according to each XENPAK module.

Table A-14   Recommended Cable Types and Specifications

XENPAK PHY	Type	Max. Length	Connector
10GBASE-LR	SMF	10 km (6.21 mi)	SC
10GBASE-ER[1]	SMF	40 km (24.85 mi)	SC
10GBASE-LX4	SMF MMF	10 km (6.21 mi) 300 m (984.25 ft)	SC
10GBASE-SR	62.5 um MMF 200Mhz/km 50 um MMF 400Mhz/km 50 um MMF 2000Mhz/km	33 m (108 ft) 66 m (217 ft) 300 m (884 ft)	SC SC SC

1. The 10GBASE-ER XENPAK requires a minimum of 5 dB attenuation or a cable length of about 10 km.

COM Port Pinout Assignments

The COM port is a serial communications port for local access to Local Management. Refer to Table A-15 for the COM port pin assignments.

Table A-15   COM Port Pin Assignments

Pin	Signal Name	Input/Output
1	Transmit Data (XMT)	Output
2	Data Carrier Detect (DCD)	Output
3	Data Set Ready (DSR)	Input
4	Receive Data (RCV)	Input
5	Signal Ground (GND)	NA
6	Data Terminal Ready (DTR)	Output
7	Request to Send (RTS)	Input
8	Clear to Send (CTS)	NA

Regulatory Compliance

The 7GR4270-12, 7GR4202-30, 7GR4280-19, and 7KR4290-02 meet the safety and electromagnetic compatibility (EMC) requirements listed in Table A-16:

Table A-16   Compliance Standards

Regulatory Compliance	Standards
Safety	UL 60950, CSA C22.2 No. 60950, 73/23/EEC, EN 60950, IEC 60950, EN 60825, 21 CFR 1040.10
Electromagnetic Compatibility (EMC)	47 CFR Parts 2 and 15, CSA C108.8, 89/336/EEC, EN 55022, EN 61000-3-2, EN 61000-3-3, EN 55024, AS/NZS CISPR 22, VCCI V-3

B

Mode Switch Settings and Installing Options

This appendix covers the following items:

Required Tools

Use the following tools to perform the procedures provided in this appendix:

- Antistatic wrist strap

- Phillips screwdriver

> ⚠️ **Caution:** An antistatic wrist strap is required to perform the procedures in this appendix. Use the antistatic wrist strap to minimize ESD damage to the devices involved.
>
> **Precaución:** Para llevar a cabo los procedimientos especificados en el apéndice deberá utilizar una pulsera antiestática. Esta pulsera sirve para minimizar los efectos de las descargas de electricidad estática.

Setting the Mode Switches

> ⚠️ **Caution:** Read the appropriate sections to be fully aware of the consequences when changing switch settings.
>
> Only qualified personnel should change switch settings.
>
> **Precaución:** Si desea modificar la configuración del interruptor, lea las secciones correspondientes para saber cuál será el resultado de hacerlo.
>
> Estas modificaciones a la configuración sólo debe realizarlas personal calificado.

Figure B-3 through Figure B-5 show the location of the mode switches and the switch settings for normal operation. These switches are set at the factory and rarely need to be changed.

Switch definitions and positions are as follows:

- Switches 1 through 6 – For Enterasys Networks use only.

- Switch 7 – Clear Persistent Data. Changing the position of this switch clears Persistent Data on the next power-up of the module. All user-entered parameters (such as the IP address, module names, and so forth) are reset to the factory default settings. Once the module resets, you can either use the factory default settings or reenter your own parameters.

- Switch 8 – Clear Admin Password. Changing the position of this switch clears the admin password, and restores the factory default password on the next power-up of the module. Once the module resets, you can either use the factory default settings or reenter your own password.

Note: Do not change the position of Switch 8 unless it is necessary to reset the admin password to its factory default setting.

Figure B-1   Mode Switch Location on 7GR4270-12
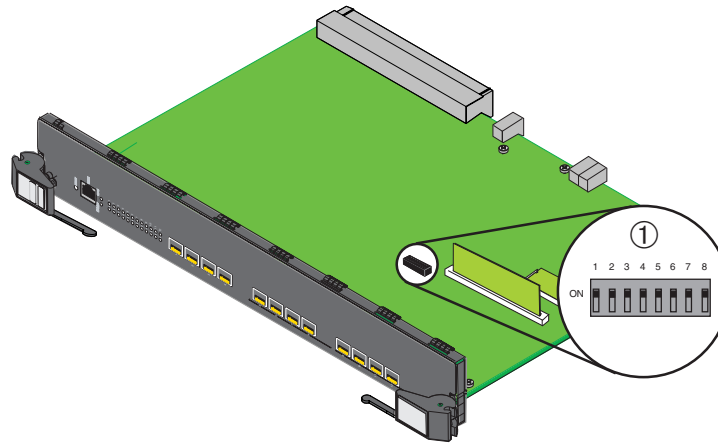
1 Mode switch bank (7GR4270-12)

Figure B-2   Mode Switch Location on 7GR4202-30
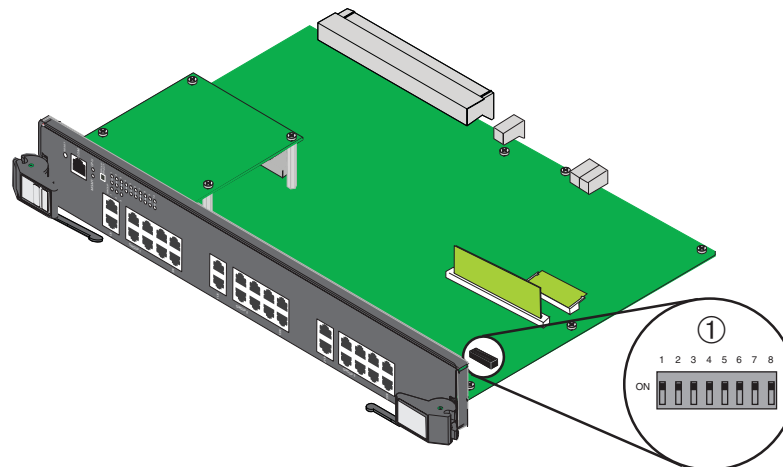
1 Mode switch bank (7GR4202-30)

Figure B-3   Mode Switch Location on the 7GR4280-19
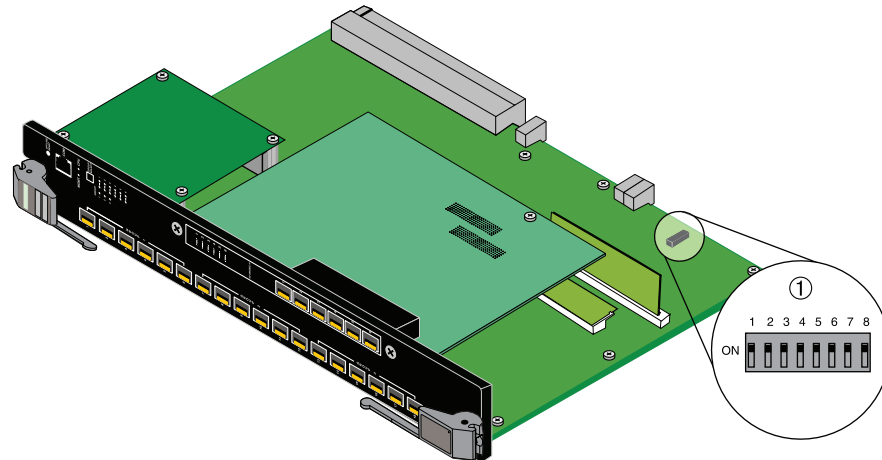
1   Mode switch pack (7GR4280-19)

Figure B-4   Mode Switch Location on the 7KR4290-02
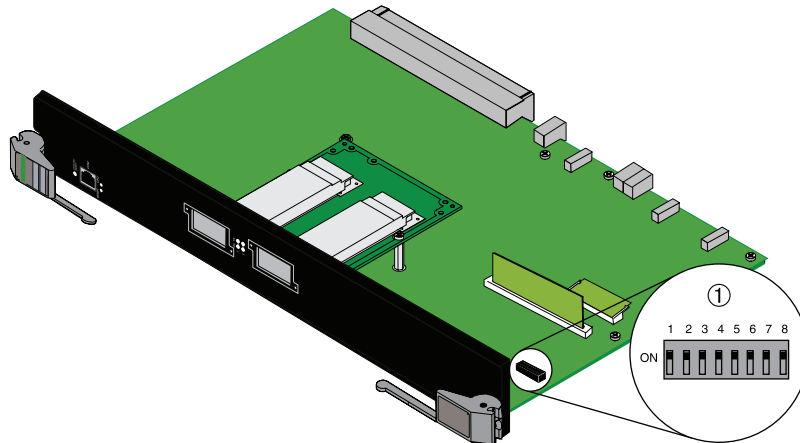
1   Mode switch bank (7KR4290-02)

Memory Locations and Replacement Procedures

In the event that the Dual in Line Memory Module (DIMM) or DRAM Single In-line Memory Module (SIMM) needs to be replaced, the following sections describe how to access, locate, and replace these memory modules. If you have questions concerning the replacement of the memory modules, refer to "Getting Help" on page xv for details on how to contact Enterasys Networks.

Location of DIMM and DRAM SIMM Memory Modules

Figure B-5 through Figure B-7 show the locations of the DIMM and DRAM SIMM on each main board. The 7GR4270-12 is shown in Figure B-5. However, the approximate location also applies to the 7GR4202-30.

Figure B-5   DIMM and DRAM SIMM Locations for 7GR4270-12 and 7GR4202-30
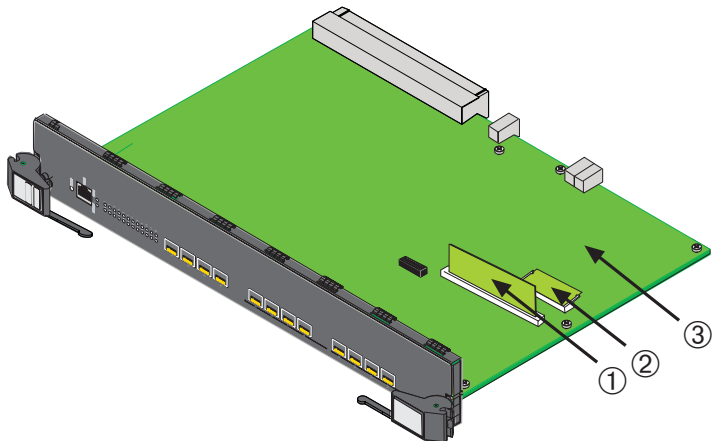
1 DRAM SIMM	**2** Flash DIMM	**3** Main PC board (7GR4270-12 is shown)

Figure B-6   DIMM and DRAM SIMM Locations for 7GR4280-19
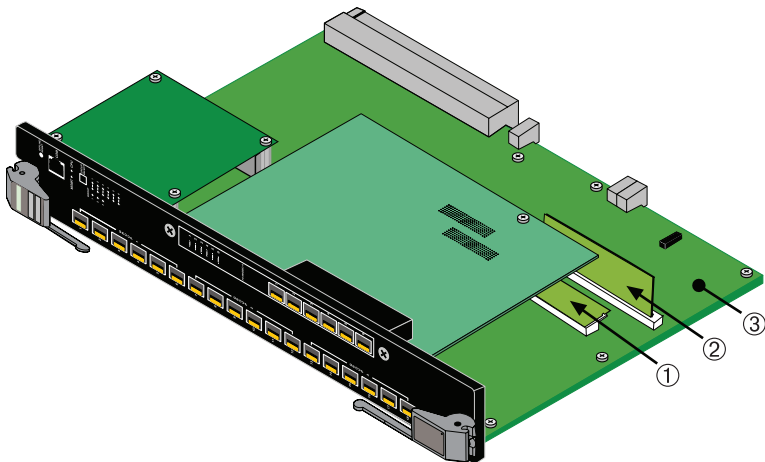
1 Flash DIMM	**2** DRAM SIMM	**3** Main PC board

Figure B-7   DIMM and DRAM SIMM Locations for 7KR4290-02
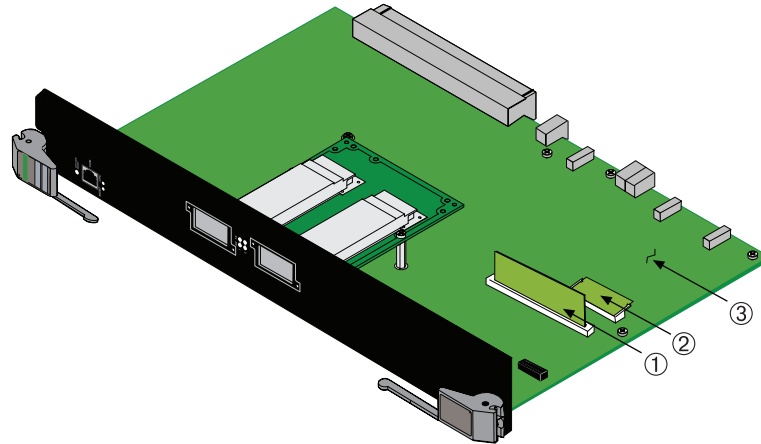
1 DRAM SIMM	**2** Flash DIMM	**3** Main PC board

DRAM SIMM Replacement Procedure

Note: To access and remove a DIMM or DRAM SIMM memory module, you may need to remove the optional network expansion module (NEM), if one is installed in your DFE-Diamond module. To remove the NEM, refer to the instructions in "Removing the Optional Network Expansion Module (NEM)" on page B-9.

Removing the DRAM SIMM

Caution: Observe all antistatic precautions when handling sensitive electronic equipment.

Precaución: Al trabajar con equipos electrónicos sensibles, tome todas las precauciones de seguridad para evitar descargas de electricidad estática.

To remove the existing DRAM SIMM, proceed as follows:

1. Locate the DRAM SIMM connector on the main PC board. Refer back to the applicable figure for your module (Figure B-5, Figure B-6, or Figure B-7).

2. Push the connector arms away from the DRAM SIMM, as shown in Figure B-8, enough to release the DRAM SIMM from the connector contacts.

3. Pull the DRAM SIMM straight up and remove it from the connector contacts.

Figure B-8   Removing the Existing DRAM SIMM

| **1** | Connector arms | **2** | DRAM SIMM | **3** | Connector contacts |
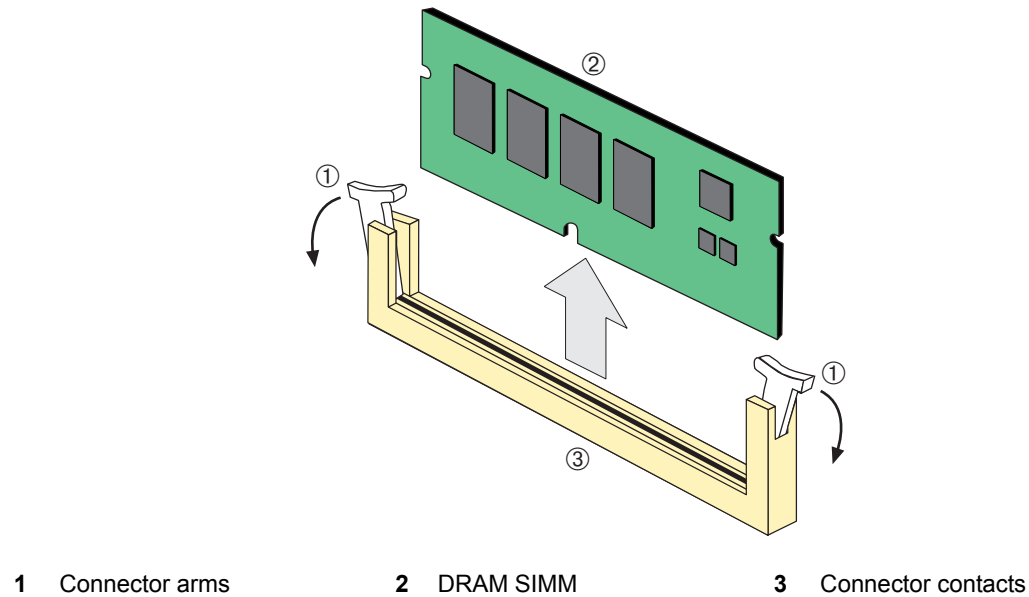
Installing the DRAM SIMM

⚠️ **Caution:** Observe all antistatic precautions when handling sensitive electronic equipment.

Precaución: Al trabajar con equipos electrónicos sensibles, tome todas las precauciones de seguridad para evitar descargas de electricidad estática.

To install a DRAM SIMM, refer to Figure B-9 and proceed as follows:

1. Push the connector arms away from the DRAM SIMM enough to insert the DRAM SIMM into the connector contacts.

2. Insert the DRAM SIMM straight down between the connector contacts enough for the tabs on the connector arms to align with the two DRAM SIMM alignment notches.

3. Push the DRAM SIMM down into the connector contacts. Then rotate the two connector arms toward the DRAM SIMM to lock it into place.

Figure B-9   Installing the DRAM SIMM
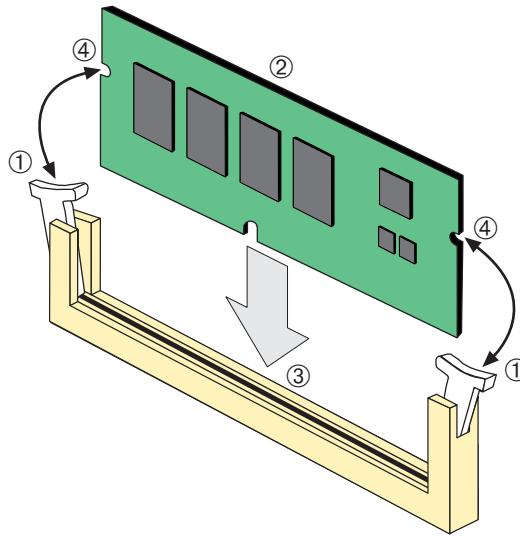
1	DRAM SIMM Connector arms	**3**	Connector contacts
2	DRAM SIMM	**4**	DRAM SIMM alignment notches (2)

DIMM Replacement Procedure

Note: To access and remove a DIMM or DRAM SIMM memory module, you may need to remove the optional network expansion module (NEM), if one is installed in your DFE-Diamond module. To remove the NEM, refer to the instructions in "Removing the Optional Network Expansion Module (NEM)" on page B-9.

Removing the DIMM

Caution: Observe all Electrostatic Discharge (ESD) precautions when handling sensitive electronic equipment.

Precaución: Al trabajar con equipos electrónicos sensibles, tome todas las precauciones de seguridad para evitar descargas de electricidad estática.

To remove the existing DIMM, proceed as follows:

1. Locate the DIMM connector on the main PC board. Refer back to

   – Figure B-5 for the DIMM location on the 7GR4270-12 and 7GR4202-30 modules, and

   – Figure B-6 for the DIMM location on the 7GR4280-19,

   – Figure B-7 for the DIMM location on the 7KR4290-02 modules.

2. Push the connector arms away from the DIMM, as shown in Figure B-10, and simultaneously lift the DIMM enough to release it from the connector fingers.

Figure B-10   Removing the Existing DIMM
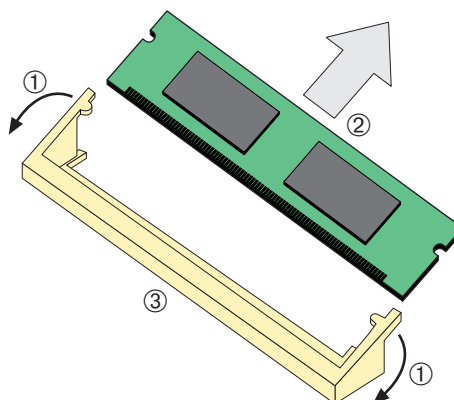
| **1** | Connector arms | **2** | DIMM | **3** | Connector fingers |

3. Rotate the DIMM upwards, then remove it from the connector fingers.

Installing the DIMM

> ⚠ **Caution:** Observe all Electrostatic Discharge (ESD) precautions when handling sensitive electronic equipment.
>
> **Precaución:** Al trabajar con equipos electrónicos sensibles, tome todas las precauciones de seguridad para evitar descargas de electricidad estática.

To install a DIMM, refer to Figure B-11 and proceed as follows:

1. Insert the DIMM down between the connector fingers.

2. Pivot the DIMM downward so the tabs on the connector arms align with the two DIMM alignment notches. With the two connector arms spread outward, push the DIMM down between the connector arms. Then release the two connector arms to lock the DIMM into place.

3. If necessary, reinstall the NEM. Refer to the installation instructions shipped with the NEM for details.

Figure B-11   Installing the DIMM
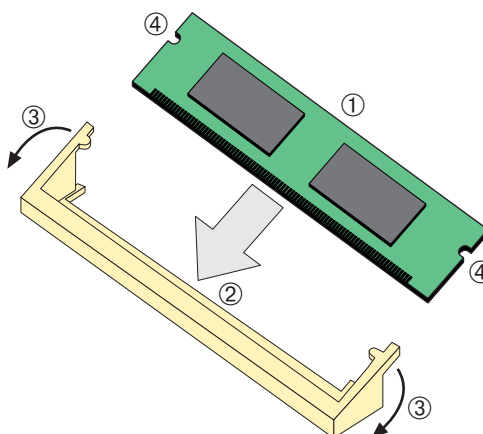
| **1** | DIMM | **3** | Connector arms |
| **2** | Connector fingers | **4** | DIMM alignment notches (2) |

Removing the Optional Network Expansion Module (NEM)

Refer to Figure B-12 and proceed as follows:

1. Attach the antistatic wrist strap (refer to the instructions on the antistatic wrist strap package).

Figure B-12   Removing the Optional Network Expansion Module (NEM)
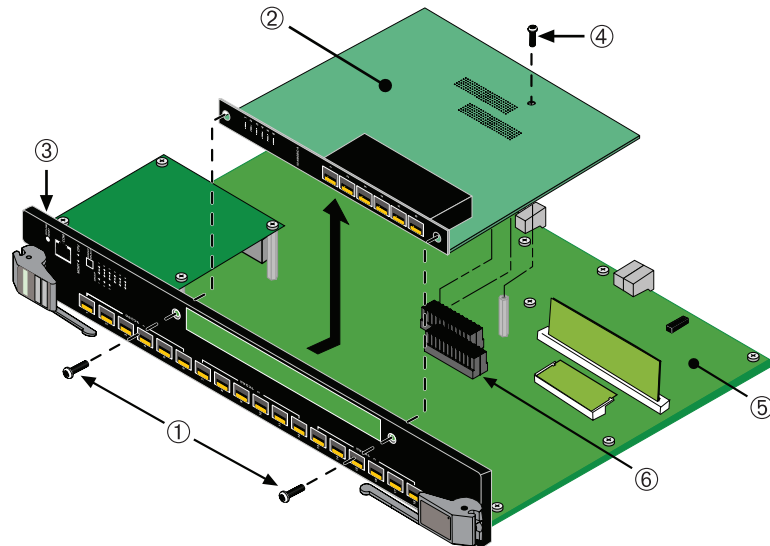
1	Coverplate screws (2)	**4**	Screw
2	NEM	**5**	Main PC board
3	DFE module front panel	**6**	Main board connectors

2. Remove and save the two coverplate screws fastening the NEM to the DFE module front panel.

3. Remove and save the screw fastening the NEM to the standoff on the main PC board. The screws removed in steps 2 and 3 are used later to reinstall the NEM.

4. Lift and remove the NEM off the two main PC board connectors. Now you have access to the DRAM SIMM and DIMM. To replace the DRAM SIMM, refer to "DRAM SIMM Replacement Procedure" on page B-5. To replace the DIMM, refer to "Removing the DIMM" on page B-7.

5. Reinstall the NEM. Refer to the installation instructions shipped with the NEM for details.

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